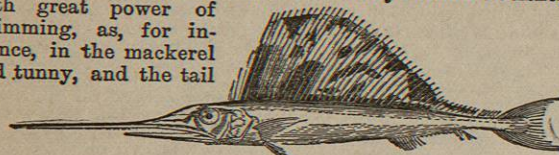


SWORD-FISH.—Sword-fishes are a small family of spiny-rayed fishes (*Xiphiidae*), the principal characteristic of which consists in the prolongation of the upper jaw into a long pointed sword-like weapon. The "sword" is formed by the coalescence of the intermaxillary and maxillary bones, which possess an extremely hard texture; it has the shape of a much elongate cone, more or less flattened throughout its whole length; the end is sharply pointed. It is smooth above and on the upper part of the sides, and rough below owing to the presence of innumerable rudimentary teeth, which have no function.

The general form of the body is well proportioned, somewhat elongate, and such as is always found in fishes with great power of swimming, as, for instance, in the mackerel and tunny, and the tail



Sword-Fish
(*Histiophorus pulchellus*).

terminates in a powerful bilobed caudal fin. A long fin occupies nearly the whole length of the back, whilst the anal fin is generally interrupted in the middle, and consequently appears to be double. The skin is very firm, partly naked, partly with small lanceolate scales deeply imbedded in the skin. The teeth of the lower jaw are, like those of the upper, merely rudimentary structures, which render the surface of the bone rough without possessing any special function.

Sword-fishes have been divided into three generic groups:—

- Histiophorus*, with a high dorsal fin which can be spread out like a sail, and with ventral fins which are reduced to a pair of long styliform appendages.
- Tetrapturus*, with a dorsal fin of which the anterior rays only are elongate, the remainder of the fin being low or partly obsolete, and with styliform ventral fins as in the preceding genus.
- Xiphias*, with the dorsal fin shaped as in *Tetrapturus*, but without ventral fins.

Sword-fishes are truly pelagic fishes, which either singly or in pairs or in smaller or larger companies roam over the oceans of the tropical and subtropical zones of both hemispheres. Some species wander regularly or stray far into the temperate seas. Some of the tropical forms are the largest of Acanthopterygian fishes, and not exceeded in size by any other Teleostean; such species attain to a length of from 12 to 15 feet, and swords have been preserved more than 3 feet long and with a diameter of at least 3 inches at the base. The *Histiophori*, which inhabit chiefly the Indo-Pacific Ocean, but occur also in the Atlantic, seem to possess in their high dorsal fin an additional aid for locomotion. During the rapid movements of the fish this fin is folded downwards on the back, as it would impede the velocity of progress by the resistance it offers to the water; but, when the fish is swimming in a leisurely way, it is frequently seen with the fin erected and projecting out of the water, and when quietly floating on the surface it can sail by the aid of the fin before the wind, like a boat.

The food of the sword-fishes is the same as that of tunnies, and consists of smaller fish, and probably also in great measure of pelagic cuttle-fishes. It has been ascertained by actual observation that sword-fishes procure their food by dashing into a school of fishes, piercing and killing a number of them with their swords; and this kind of weapon would seem to be also particularly serviceable in killing large cuttle-fish, like the saw of saw-fishes, which is used for the same purpose. But the swords of the large species of *Histiophorus* and *Tetrapturus* are, besides, most formidable weapons of aggression. These fishes never hesi-

tate to attack whales and other large cetaceans, and, by repeatedly stabbing them, generally retire from the combat victorious. That they combine in these attacks with the thresher-shark is an often-repeated story which has its foundation in the imagination of the observer, and which is fully disproved by the fact that the dentition of the thresher-shark is much too weak to make an impression on the skin of any cetacean. The cause which excites sword-fishes to such attacks is unknown; but they follow the instinct so blindly that they not rarely assail boats and ships in a similar manner, evidently mistaking them for cetaceans. They easily pierce the light canoes of the natives of the Pacific islands and the heavier boats of the professional sword-fish fishermen, often dangerously wounding the persons sitting in them. Attacks by sword-fishes on ocean-going ships are so common as to be included among sea-risks: they are known to have driven their weapon through copper-sheathing, oak-plank, and timber to a depth of nearly 10 inches, part of the sword projecting into the inside of the ship; and the force required to produce such an effect has been described by Prof. Owen in a court of law as equal to "the accumulated force of fifteen double-handed hammers," and the velocity as "equal to that of a swivel-shot," and "as dangerous in its effects as a heavy artillery projectile." Among the specimens of planking pierced by sword-fishes which are preserved in the British Museum there is one less than a foot square which encloses the broken ends of three swords, as if the fishes had had the object of concentrating their attack on the same vulnerable point of their supposed enemy. The part of the sword which penetrates a ship's side is almost always broken off and remains in the wood, as the fish is unable to execute sufficiently powerful backward movements to free itself by extracting the sword.

In the Mediterranean and on the Atlantic coasts of the United States the capture of sword-fishes forms a regular branch of the fishing-industry. The object of the fishery in the Mediterranean is the common European sword-fish (*Xiphias gladius*), the average weight of which is about one cwt., and which is abundant off the Sicilian coasts and on the opposite coast of Calabria. Two methods are employed,—that by harpoons, chiefly used for larger fish, and that by peculiarly constructed nets called *palamitare*. This fishery is very productive: a company of fishermen frequently capture from twenty to fifty fish in a single day, and the average annual catch in Sicily and Calabria is reported to be 140,000 kilogrammes (138 tons). The products of the fishery are consumed principally in a fresh state, but a portion is preserved in salt or oil. The flesh of the sword-fish is much preferred to that of the tunny, and always commands a high price. This species is occasionally captured on the British coast.

On the coast of the United States a different species, *Histiophorus gladius*, occurs; it is a larger fish than the Mediterranean sword-fish, attaining to a length of from 7 to 12 feet, and an average weight of 300 or 400 lb. It is captured only by the use of the harpoon. From forty to fifty vessels, schooners of some 50 tons, are annually engaged in this fishery, with an aggregate catch amounting annually to about 3400 sword-fishes, of a value of \$45,000. The flesh of this species is inferior in flavour to that of the Mediterranean species, and is principally consumed after having been preserved in salt or brine.

Useful and detailed information on the sword-fish fishery can be obtained from A. T. Tozzetti, "La Pesca nei Mari d'Italia e la Pesca all' Estero esercitata da Italiani," in *Catalogo Espositivo Internazionale di Pesca in Berlino*, 1880; also from *La Pesca del Pesce-Spada nello Stretto di Messina* (Messina, 1880), and from G. Brown Goode, "Materials for a History of the Sword-fish," in *Report of the Commissioner of Fish and Fisheries*, part viii., Washington, 1883. (A. C. G.)

SYBARIS, a city of Magna Græcia, on the Gulf of Iarantum, between the rivers Crathis (Crati) and Sybaris (Coscile), which now meet 3 miles from the sea, but anciently had independent mouths, was the oldest Greek colony in this region. It was an Achaean colony founded by Isus of Helice (720 B.C.), but had among its settlers many Troezenians, who were ultimately expelled. Placed in a very fertile, though now most unhealthy, region, and following a liberal policy in the admission of citizens from all quarters, the city became great and opulent, with a vast subject territory and divers daughter colonies even on the Tyrrhenian Sea (Posidonia, Laus, Scidrus). For magnificence and luxury the Sybarites were proverbial throughout Greece, and in the 6th century probably no Hellenic city could compare with its wealth and splendour. At length contests between the democrats and oligarchs, in which many of the latter were expelled and took refuge at Crotona, led to a war with that city, and the Crotonians with very inferior forces were completely victorious. They razed Sybaris to the ground and turned the waters of Crathis to flow over its ruins (510 B.C.). Explorations undertaken by the Italian Government in 1879 have failed to lead to a precise knowledge of the site.

See *Academy*, vol. xvi. p. 73 (24th January 1880); Lenormant, *La Grande-Grèce* (1881), l. 325 sq.; and THURILL.

SYCAMORE. See FIG, vol. ix. p. 154, and MAPLE, vol. xv. p. 524.

SYDENHAM, a suburb of London, in the county of Kent, is finely situated chiefly on elevated ground about 7 miles south of Charing Cross, London. There is railway communication by the London, Brighton, and South Coast, the Mid Kent branch of the South-Eastern, and the London, Chatham, and Dover lines. Formerly Sydenham was a small hamlet of Lewisham, which rose into favour from its sylvan beauty, its pleasant situation, and its medicinal waters. These springs were discovered in 1640 on Sydenham common. The quality of the water resembled that of Epsom, and was regarded as efficacious in scorbutic and paralytic affections. After the construction of a railway the suburb grew into high repute as a residence, especially for the wealthier commercial and professional classes. The construction of the Crystal Palace (see LONDON, vol. xiv. p. 836) in 1854 greatly aided the prosperity of Sydenham, although the building is not within its boundaries. There is a public lecture hall and literary institute at Sydenham Hill, and a school of art, science, and literature in connexion with the Crystal Palace. The charitable institutions include a home and infirmary for sick children and the South London dispensary for women. The population of the township (area, 1623 acres) was 19,065 in 1871, and 26,076 in 1881.

SYDENHAM, THOMAS (1624-1689), "the English Hippocrates," was born at Winford Eagle in Dorset in 1624, where his father was a gentleman of property and good pedigree. At the age of eighteen he was entered at Magdalen Hall, Oxford; after two years his college studies appear to have been interrupted, and he served for a time as an officer in the army of the Parliament. He completed his Oxford course in 1648, graduating as bachelor of medicine, and about the same time he was elected a fellow of All Souls College. It was not until nearly thirty years later (1676) that he graduated as M.D., not at Oxford, but at Pembroke Hall, Cambridge, where his eldest son was then an undergraduate. His interest in medicine seems to have been aroused at an early age. Nothing is known of Sydenham's life between 1648 and 1663; but it is probable that he spent part of the time at Oxford. It is said also (on the authority of one Desault, in a work published at Bordeaux in 1733) that he studied at Montpellier, although it is not so stated by himself in his

dedicatory letter to Dr Maplettoft, among the other autobiographical facts there given. In 1663 he passed the examinations of the College of Physicians for their licence to practise in Westminster and 6 miles round; but it is probable that he had been settled in London for some time before that. This minimum qualification to practise was the single bond between Sydenham and the College of Physicians throughout the whole of his career. He seems to have been distrusted by the heads of the faculty because he was an innovator and something of a plain-dealer. In his letter to Maplettoft he refers to a class of detractors "qui vitio statim vertunt si quis novi aliquid, ab illis non prius dictum vel etiam inauditum, in medium proferat"; and in a letter to Robert Boyle, written the year before his death (and the only authentic specimen of his English composition that remains), he says, "I have the happiness of curing my patients, at least of having it said concerning me that few miscarry under me; but [I] cannot brag of my correspondency with some other of my faculty. . . . Though yet, in taking fire at my attempts to reduce practice to a greater easiness, plainness, and in the meantime letting the mountebank at Charing Cross pass unrailled at, they contradict themselves, and would make the world believe I may prove more considerable than they would have me." Sydenham attracted to him in warm friendship some of the most discriminating men of his time, such as John Locke and Robert Boyle. His first book, *Methodus Curandi Febres*, was published in 1666; a second edition, with an additional chapter on the plague, in 1668; and a third edition, much enlarged and bearing the better-known title of *Observationes Medicae*, in 1676. His next publication was in 1680 in the form of two *Epistolae Responsoriae*, the one, "On Epidemics," addressed to Brady, regius professor of physic at Cambridge, and the other, "On the Lues Venerea," to Paman, public orator at Cambridge and Gresham professor in London. In 1682 he issued another *Dissertatio Epistolaris*, on the treatment of confluent smallpox and on hysteria, addressed to Dr Cole of Worcester. The *Tractatus de Podagra et Hydrope* came out in 1683, and the *Schedula Monitoria de Nova Febre Ingressu* in 1686. His last completed work, *Processus Integri*, is an outline sketch of pathology and practice; twenty copies of it were printed in 1692, and, being a compendium, it has been more often republished both at home and abroad than any other of his writings separately. A fragment on pulmonary consumption was found among his papers. His collected writings occupy about 600 pages 8vo in the original Latin.

Hardly anything is known of Sydenham's personal history in London. He died in an acute paroxysm of gout in December 1689. He was buried in the church of St James's, Piccadilly, where a mural slab was put up by the College of Physicians in 1810.

Although Sydenham was a highly successful practitioner and saw more than one new edition of his various tractates called for, besides foreign reprints, in his lifetime, his fame as the father of English medicine, or the English Hippocrates, was decidedly posthumous. For a long time he was held in vague esteem for the success of his cooling (or rather expectant) treatment of smallpox, for his laudanum (the first form of a tincture of opium), and for his advocacy of the use of Peruvian bark in quartan agues. There were, however, those among his contemporaries who understood something of Sydenham's importance in larger matters than details of treatment and pharmacy, chief among them being the talented Morton. But the attitude of the academical medicine of the day is doubtless shown forth in Lister's use of the term "sectaries" for Sydenham and his admirers, at a time (1694) when the leader had been dead five years. If there were any doubt that the opposition to him was quite other than political, it would be set at rest by the testimony of Dr Andrew Brown,¹ who went from Scotland to inquire into Sydenham's practice, and has incidentally revealed

¹ See Dr John Brown's *Horae Subsecivae*, art. "Dr Andrew Brown, and Sydenham."

what was commonly thought of it at the time, in his *Vindictory Schedule concerning the New Cure of Fevers*. In the series of Harveian orations at the College of Physicians, Sydenham is first mentioned in the oration of Arbuthnot (1727), who styles him "amulus Hippocratis." Boerhaave the Leyden professor, was wont to speak of him in his class (which had always some pupils from England and Scotland) as "Anglie lumen, artis Phœbum, veram Hippocratici viri speciem." Haller also marked one of the epochs in his scheme of medical progress with the name of Sydenham. He is indeed famous because he inaugurated a new method and a better ethics of practice, the worth and diffusive influence of which did not become obvious (except to those who were on the same line with himself, such as Morton) until a good many years afterwards. It remains to consider briefly what his innovations were.

First and foremost he did the best he could for his patients, and made as little as possible of the mysteries and traditional dogmas of the craft. All the stories told of him are characteristic. Called to a gentleman who had been subjected to the lowering treatment, and finding him in a pitiful state of hysterical upset, he "conceived that this was occasioned partly by his long illness, partly by the previous evacuations, and partly by emptiness. I therefore ordered him a roast chicken and a pint of canary." A gentleman of fortune who was a victim to hypochondria was at length told by Sydenham that he could do no more for him, but that there was living at Inverness a certain Dr Robertson who had great skill in cases like his; the patient journeyed to Inverness full of hope, and finding no doctor of the name there, came back to London full of rage, but cured withal of his complaint. Of a piece with this is his famous advice to Blackmore. When Blackmore first engaged in the study of physic he inquired of Dr Sydenham what authors he should read, and was directed by that physician to *Don Quixote*, "which," said he, "is a very good book; I read it still." There were cases, he tells us, in his practice where "I have consulted my patient's safety and my own reputation most effectually by doing nothing at all." It was in the treatment of small-pox that his startling innovations in that direction made most stir. It would be a mistake, however, to suppose that Sydenham wrote no long prescriptions, after the fashion of the time, or was entirely free from theoretical bias. Doctrines of disease he had, as every practitioner must have; but he was too much alive to the multiplicity of new facts and to the infinite variety of individual constitutions to aim at symmetry in his theoretical views or at consistency between his practice and his doctrines; and his treatment was what he found to answer best, whether it were *secundum artem* or not. His fundamental idea was to take diseases as they presented themselves in nature and to draw up a complete picture ("krankheitsbild" of the Germans) of the objective characters of each. Most forms of ill-health, he insisted, had a definite type, comparable to the types of animal and vegetable species. The conformity of type in the symptoms and course of a malady was due to the uniformity of the cause. The causes that he dwelt upon were the "evident and conjunct causes," or, in other words, the morbid phenomena; the remote causes he thought it vain to seek after. Acute diseases, such as fevers and inflammations, he regarded as a wholesome constrictive effort or reaction of the organism to meet the blow of some injurious influence operating from without; in this he followed the Hippocratic teaching closely as well as the Hippocratic practice of watching and aiding the natural crises. Chronic diseases, on the other hand, were a depraved state of the humours, mostly due to errors of diet and general manner of life, for which we ourselves were directly accountable. Hence his famous dictum: "*acutos dico, qui ut plurimum Deum habent auctorem, sicut chronici ipsos nos.*" Sydenham's nosological method is essentially the modern one, except that it wanted the morbid anatomy part, which was first introduced into the "natural history of disease" by Morgagni nearly a century later. In both departments of nosology, the acute and the chronic, Sydenham contributed largely to the natural history by his own accurate observation and philosophical comparison of case with case and type with type. The *Observationes Medicæ* and the first *Epistola Responsoria* contain evidence of a close study of the various fevers, fluxes, and other acute maladies of London over a series of years, their differences from year to year and from season to season, together with references to the prevailing weather,—the whole body of observations being used to illustrate the doctrine of the "epidemic constitution" of the year or season, which he considered to depend often upon inscrutable telluric causes. The type of the acute disease varied, he found, according to the year and season, and the right treatment could not be adopted until the type was known. There had been nothing quite like this in medical literature since the Hippocratic treatise, *Περὶ ἀέρος, ἰδῶρων, τῶρων*; and there are probably some germs of truth in it still undeveloped, although the modern science of epidemiology has introduced a whole new set of considerations. Among other things Sydenham is credited with the first diagnosis of scarlatina and with the modern definition of chorea (in *Sched. Monit.*). After smallpox, the diseases to which he refers most are hysteria and gout, his description of the latter

(from the symptoms in his own person) being one of the classical pieces of medical writing. While Sydenham's "natural history" method has doubtless been the chief ground of his great posthumous fame, there can be no question that another reason for the admiration of posterity was that which is indicated by R. G. Latham, when he says, "I believe that the moral element of a liberal and candid spirit went hand in hand with the intellectual qualifications of observation, analysis, and comparison."

The most critical biography is that by Dr R. G. Latham prefixed to his translation of *Sydenham's Works*, (2 vols., London, 1845, Syd. Soc.). Dr John Brown's "Locke and Sydenham," in *Horæ Subsecivæ*, Edinburgh, 1858, is more of the nature of eulogy. Many collected editions of his works have been published, as well as three English translations. Dr W. A. Greenhill's Latin text (London, 1844, Syd. Soc.) is a model of editing and indexing. There have been foreign monographs on Sydenham by Goeden (Berlin, 1827), Rovers (Dort, 1838), F. Jahn (Eisenach, 1840), and Hwasser (Upsala, 1846). The most interesting summary of doctrine and practice by the author himself is the introduction to the 3d ed. of *Observationes Medicæ* (1676). (C. G.)

SYDNEY, the capital of New South Wales, and the oldest city in Australia, is situated on the east coast of that island-continent in 33° 51' 41" S. lat. and 151° 12' 23"-25' (10h. 4m. 49.55s.) E. long. It lies on the southern shore of the magnificent harbour of Port Jackson, which in 1770 was named, though not discovered, by Captain Cook. He anchored and landed in Botany Bay, about 6 miles to the south, and on afterwards coasting to the north noted what looked like an inlet, to which he gave the name of Port Jackson, after Sir George Jackson, one of the secretaries to the admiralty. It may seem strange that so careful an observer as Cook should have passed close to one of the finest harbours in the world without recognizing its capacity; but the cliffs which guard the entrance are 300 feet in height, and no view of the landlocked basin can be seen from the masthead. Middle Head, which is posted right opposite the entrance, closes it in, and it is necessary to enter, turn to the south, and then to the west before the best part of the harbour discloses itself. This topographical peculiarity gives to the port its great shelter. When in 1788 Captain Phillip arrived at Botany Bay with the first convict fleet, he found its shallow waters and flat shores unsuited for the purposes of a settlement. Strangely enough he was also deterred by the want of water; yet it is on that very shore that the pumping-engine is situated by which Sydney has been supplied for many years. Going northwards, he turned in to examine Port Jackson inlet. Thither the fleet was instantly removed; and Sydney was founded, and Australian colonization started, on 26th January 1788. Captain Phillip's choice of a site was determined by the existence of fresh water in a small stream running into Sydney Cove.



FIG. 1.—Harbour and environs of Sydney.

The port is flanked on both sides by a number of promontories—its characteristic feature—so that in addition to a broad central channel with deep water there is both on the north and the south side a series of sheltered bays with good anchorage. The entrance is a mile wide, with a minimum depth of 15 fathoms. Some little distance inside is a rock awash, known as the Sow and Figs, between which and the nearest headlands on either side is an inner bar, with 20 feet of water at low tide; through this bar on the southern side a ship channel has been dredged giving 27 feet of water at neap tide. On the southern side there occur in succession Watson's Bay, Rost

Bay, Double Bay, Rushcutter's Bay, Woolloomooloo Bay, Farm Cove, Sydney Cove, Darling Harbour, Johnstone's Bay, Blackwattle Bay, Iron Cove, Five Dock Bay, Hen and Chickens Bay, besides smaller inlets. On the northern side, beginning again at the Heads, there are North Harbour, Middle Harbour (with many subsidiary inlets), Chowder Bay, Sirius Cove, Mossman's Bay, Shell Cove, Neutral Bay, Careening Cove, Lavender Bay, Berry's Bay, Ball's Head Bay, Lane Cove, Tarban Creek, and other small bays. All these promontories and coves give a length of water frontage which is estimated at not less than 110 miles. Besides these, Botany Bay, though shallow and exposed and destitute of promontories, has a coastline of about 18 miles. Into it debouches George's river,

which is navigable to Liverpool, a distance of 14 miles from the mouth, and in which are several capacious bays.

The metropolitan area of Sydney really consists of a peninsula about 13 miles in length, lying between Parramatta and George's rivers. The sea frontage of this area, from the South Head of Port Jackson to the North Head of Botany Bay, is 12 miles in length, and consists alternately of bold cliffs and beautiful beaches. Two of the latter—Bondi and Coogee—are connected with the city by tramways, and are favourite places of holiday resort. Sydney occupies, therefore, a position enjoying singular natural advantages.

The city proper, as subsequently determined, takes in the water frontage from the head of Rushcutter's Bay on

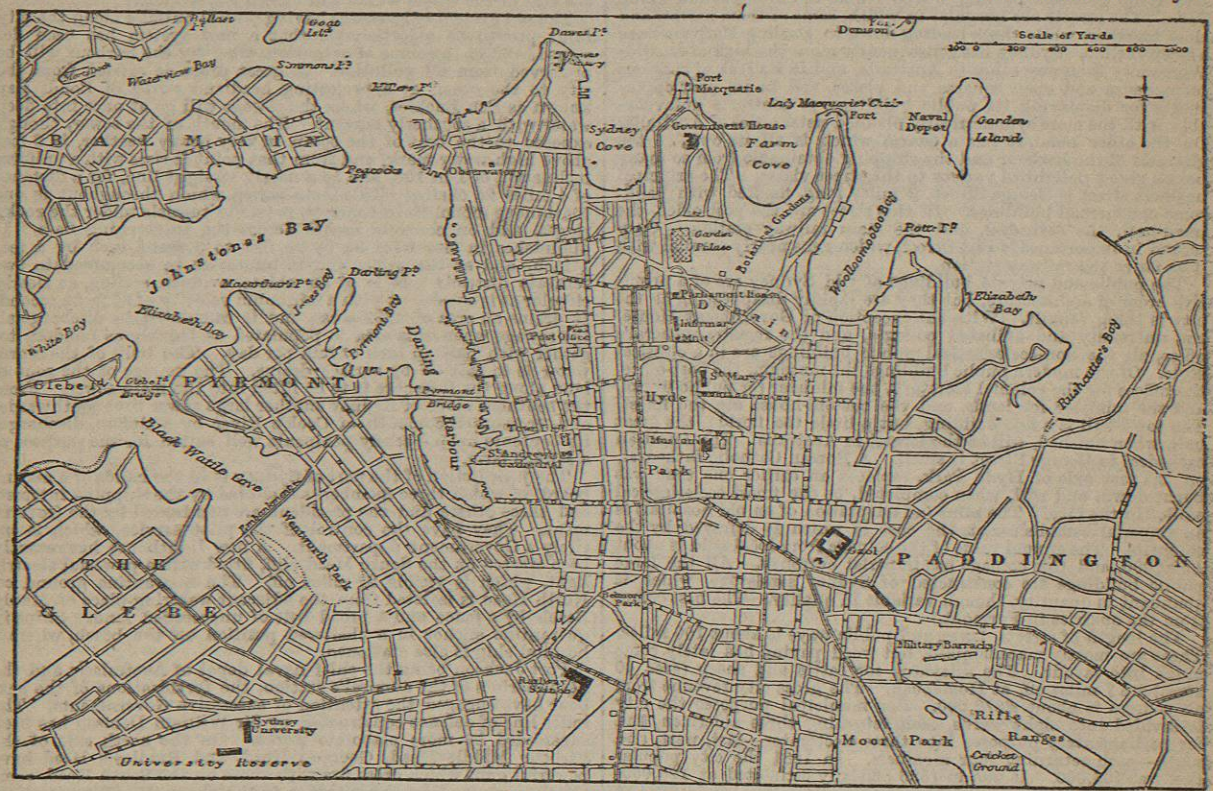


FIG. 2.—Map of Sydney

the east to the head of Blackwattle Bay on the west, giving a shore-line of 8 miles, of which 1½ are the frontage of the Domain and Botanic Gardens. The remainder is occupied for commercial purposes, and is held partly by the Government and partly by private owners. There are three large public wharfs—one, known as Circular Quay, embracing the greater part of Sydney Cove, seven-eighths of a mile in length, the second at the head of Darling Harbour, a quarter of a mile in extent, and the third at the head of Woolloomooloo Bay. The rest is occupied by private wharfs, the principal of which are on the east shore of Darling Harbour. A project is on foot for the resumption of the whole by the Government, and the making of a uniform quay, with a railway and a new street. The area of the city is 2670 acres, of which no part is more than a mile and a quarter distant from the water, whilst the average distance is three-quarters of a mile. The surface contour is undulating, the maximum

elevation being 230 feet and the average 120. The soil is sandstone, covered more or less with shaly clay. Of the city area about 800 acres are devoted to public use. The largest reserve is Moore Park, lying to the south-east of the city, nearly 500 acres in extent—originally a waste of sandhills. On it are the rifle range, the Agricultural Society's showground, and the principal cricket ground. The Inner and Outer Domains on the shore of the harbour contain about 130 acres. The former contains Government House, with its private garden and paddocks; the Outer Domain is a public park. The beautiful botanic gardens occupy the shore-line of Farm Cove, commanding the man-of-war anchorage. Hyde Park, the original race-course of the city, is about 49 acres in extent. At the north entrance is a statue of Prince Albert, and on its most elevated part is one of Captain Cook. Prince Alfred Park, on the southern boundary of the city, originally called Cleveland Paddocks, occupies nearly

18 acres, and in it is the original exhibition building, now much used for concerts and festive gatherings. Belmore Park occupies 10 acres, and Cook and Phillip Parks each about the same area. The Fort Phillip reserve is a sort of acropolis, two of its rocky sides being escarped. Here, at an elevation of 146 feet, stands the astronomical observatory. Grose Farm, on the south-west of the city, was the site of one of the earliest attempts at Government farming. It is an undulating and elevated piece of land, and is divided amongst the university and the affiliated colleges of St Paul, St John, and St Andrew, the Prince Alfred Hospital, and Victoria Park.

The city started from the banks of the Tank stream at the head of Sydney Cove, and the chief business part is still in the limited area lying between Darling Harbour and the Domain and Hyde Park. The streets are irregular in width, some of them narrow and close together, while those leading down to Darling Harbour have a steep incline. Sydney has consequently more the look of an Old-World city than any other in Australia, and in its lack of spacious promenades and open squares and places, and in its poor opportunity for displaying its public buildings, it contrasts unfavourably with the more symmetrically planned sister cities of Australia. On the other hand, it has a charm which is all its own, as the glimpses of the harbour and the shipping obtainable from so many points give a delightful variety to the street vistas. The principal business street is George Street, 2 miles long, flanked with handsome commercial buildings. In this street are the post-office, the town-hall, the cathedral, and the main railway station. Only second in importance is Pitt Street, which runs nearly parallel with it as far as the railway station.

The public and private buildings of Old Sydney are of a primitive order of architecture, but they are rapidly disappearing as the city is being rebuilt. With the exception of Government House, the university and affiliated colleges, and the registrar-general's office, all the non-ecclesiastical public buildings are in a classical style. Of the modern public buildings the museum, the post-office, the offices for the colonial secretary, the minister for public works, and the minister for lands, and the custom-house are the finest. The town-hall is a fine building, but a little too florid; the great hall, when finished, will be the largest in Australia. The Anglican cathedral in George Street is small. A Roman Catholic cathedral, on the east side of Hyde Park, replaces an earlier one that was burnt down, and will, when completed, be the finest ecclesiastical edifice in the city. The mint (an adaptation of an old hospital) is an imperial establishment, the cost of which is defrayed by the colonists. The annual value of the coinage from local gold is about £500,000, and this coinage has imperial currency. All the large public buildings are constructed of Sydney sandstone, which is abundant in quantity, though variable in quality. The best comes from the quarries in Pyrmont.

The length of streets, lanes, and public ways is about 100 miles. These are mostly macadamized, but wood paving has lately come much into favour. The saleyards for cattle and sheep (area 40 acres) are 7 miles off, at Homebush. The gross city revenue from all sources is about £376,000. For municipal purposes the city is divided into eight wards, each returning three aldermen, and for parliamentary purposes into three electorates—east, west, and south—each returning four members. In 1881 the city population was 105,000. It was in 1886 officially estimated at 125,000. The population of the suburbs was officially estimated in 1884 at 150,000, making a total metropolitan population of 275,000. Communication with the suburbs is maintained to a large extent by steam tramways, entirely in the hands of the Government. The whole district between Sydney and Parramatta is practically suburban for 2 miles on each side of the railway. The fashionable suburbs lie to the east of Sydney, the business extension of the city being more to the westward. The southern side is largely devoted to manufacturing operations, and population is rapidly extending in the direction of Botany Bay. The north shore of the harbour is outside the city limits, and the communication is by steam ferries. The north shore has deep water close in shore, but little level ground, the land rising rapidly to an elevation of 300 feet. Up this ascent the Government has constructed a cable tramway, and from the railway between Newcastle and Sydney, which crosses the Parramatta river 2 miles below the head of the navigation, there is to be a branch line of railway to the north shore, opposite the city.

Water was at first obtained from the so-called Tank stream;

¹ Paddington forms practically an eastern suburb of Sydney, with which there is constant omnibus communication. Victoria barracks are situated within its boundaries. Paddington is inhabited chiefly by the better classes, and possesses a number of public and private schools. A municipal constitution was granted it in April 1860. The population of the borough in 1881 was 9602.

afterwards recourse was had to a lagoon on the southern slope of the dividing ridge between Port Jackson and Botany Bay, from which an artificial tunnel, known as Busby's Bore, brought the water into the city at the level of Hyde Park. When a further supply was wanted the same watercourse was utilized, the works being constructed at the point where it flowed into Botany Bay. A scheme is now (1886) in course of execution to bring water from the Upper Nepean, at a point 63 miles from Sydney. Two streams running in deep sandstone gorges are connected by a tunnel, and their united waters are brought in an open conduit. From the nature of the ground no large reservoir is possible near its source; but about 15 miles from Sydney, at Prospect, near Parramatta, a dam thrown across a valley makes a storage reservoir that will hold a year's supply. From that point the water is taken by open canal and piping to the existing reservoir in Crown Street, the limited area at a higher level being supplied by pumping. The delivery into the city will be over 150,000,000 gallons daily, and the cost of the whole works will exceed £1,500,000.

The old system of sewerage having several outfalls along the city front proved so objectionable that a new system has been designed, and is in course of execution, whereby the harbour will be preserved from all pollution. A great drain is carried from the city to the ocean at a projecting headland north of Bondi Bay known as Ben Buckler, where the sewage will go at once into deep water with a southerly current. The mouth of the sewer, though exposed to the beat of the ocean in very heavy weather, is 6 feet above high-water mark, and from that point it rises with a uniform inclination of 1 in 109, and in a nearly straight line, for a distance of 4 miles 25 chains. This main sewer, which throughout is one continuous monolith in concrete, passes in tunnels under the rocky ridges, and on concrete arches across the intervening flats. It diminishes in size from 8½ by 7½ feet to 5 feet 1 inch by 4 feet 1 inch, and at the upper end it bifurcates to accommodate two separate districts. It is of an oblate, oviform section, as nearly circular as is consistent with a minimum velocity of 2½ feet a second. It drains an area of 4282 acres, and is calculated to discharge all the sewage when this area is populated as thickly as London, together with half an inch of rain per day. The bulk of the storm water is to pass off by surface drains. The sewage of the zone of land along the foreshore is to be lifted into the main sewer. From the southern slope of Sydney another large sewer runs southwards, and crossing the mouth of Cook's River by a siphon, discharges its contents upon a sandy peninsula well suited for the purpose of a sewage farm.

The jurisdiction of the port of Sydney is in the hands of a marine board, of which three members are elected by the shipping interest, and three others and the president are nominated by the Government. They have the control of the pilot service, which is entirely a Government department. A new lighthouse has recently been erected on the South Head cliff, fitted with a powerful electric light, which is visible 27 miles off. The quarantine ground on North Head is isolated from the adjacent watering-place of Manly Beach by a fence and a broad belt of unoccupied land. Ships in quarantine anchor in a sheltered position off the beach, where a hospital ship is also stationed.

Port Jackson being the chief naval depot of Australasia and the headquarters of the admiral's station, the fortifications of the harbour have engaged the attention of successive Governments. The inner line of defence constructed by Sir William Denison has been superseded by more elaborate works. On the north side of the harbour Middle Head, George's Head, and Bradley's Head have powerful guns which cross fire with those on the South Head, completely commanding the entrance to the channel. There is also a very effective torpedo service. Garden Island, off the mouth of Woolloomooloo Bay, has been handed over to the imperial Government as a naval depot; the man-of-war anchorage is close under its lee, and the colonial Government has constructed all necessary wharfs and store-houses. There is a Government dock at Cockatoo Island capable of accommodating the largest vessels, with a machine-shop close by. Adjoining this a new dock is being hewn out of the sandstone 600 feet in length and 108 feet wide; the depth of water over the sill at spring tide is to be 32 feet, and at neap tide 29 feet 6 inches, and the width at the entrance 84 feet. Mort's Dock and Engineering Company have a large dock at Waterview Bay capable of taking in all the ordinary mail steamers. There is also a patent slip, which can take up vessels of 1000 tons, and a second is in course of construction for vessels of 1500 tons. The graving-dock is 410 feet long. Besides this, there are other smaller patent slips, and a floating dock for the accommodation of smaller craft.

Sydney is in the centre of a great coal-basin, the eastern part of which is supposed to be under the sea; whether a workable seam exists under the city itself, and, if so, at what depth, is at present undetermined, borings of 2000 feet having as yet failed to strike the coal. The seams crop out at Lake Macquarie, north of Sydney, and dip to the south; they also rise to the surface at the south of Sydney, where they dip to the north. Twenty-four miles south of Sydney the seam has been found at a depth of 860 feet, and at

about the same distance to the north at a depth of 600 feet. Coal is also brought into the city by railway from the Blue Mountains and from the Mittagong district, but it is inferior in quality to that mined on the coast.

The abundance and cheapness of coal, as well as the natural and commercial advantages of Sydney, have been favourable to certain lines of manufacturing industry, notwithstanding the high price of labour. In addition to the industries connected with shipping, those connected with the pastoral industry have also been developed, such as tanning, glue-making, meat-preserving, &c. The large railway works have, under the patronage of the Government, led to the manufacture of locomotives, and nearly all the rolling stock is made in the colonies. Omnibuses, cabs, carriages, buggies, drays, and carts are made in every variety and of excellent quality, as is also harness. Bootmaking is an extensive business; there are also manufactories of tobacco, sugar, kerosene, spirits, beer, tweed, paper, furniture, glass, pottery, and stoves, as well as a great variety of minor industries.

Public schools abound, with merely nominal fees. There is a high school for boys and girls. The grammar-school, with an attendance of 400 boys, receives from Government £1500 a year, with the free use of the buildings. To the handsome university buildings a medical school is now being added. The great hall is the finest Gothic building in Australasia. The university is a teaching as well as examining institution, degrees being given in the four faculties of arts, medicine, law, and science. The university, which is governed by a senate elected by the graduates, has a Government endowment of £12,000 a year, and has been enriched by several donations and bequests amounting to £250,000, of which about £180,000 by Mr Challis. To it are attached three denominational affiliated colleges, one belonging to the Anglican Church, one to the Roman Catholic, and one to the Presbyterian; to each the Government contributed the land, £10,000 towards the building fund, and an annual stipend of £500 a year for the principal. Technical education is conducted under the auspices of a board supported entirely at the cost of the Government. The pupils already number more than a thousand, and the attendance at the classes is steadily increasing. There is a good school of arts, with 400 members, and a good circulating library. The public free library is supported by the Government, and to it is attached a lending branch. The Royal Society has a roll of 500 members, meets periodically for the reading and discussion of scientific papers, publishes its transactions, and has a small library. The Linnean Society is also well supported, and a Geographical Society has lately been started. The museum, in College Street, is managed by trustees and supported wholly at the cost of the Government. There is a small museum attached to the university, to which Mr Macleay has bequeathed his collection, which is especially rich in natural history.

Sydney has many charitable institutions. It has three hospitals, the newest and largest, which is close to the university, having been built after the best European models. There are three large lunatic asylums in the suburbs; the latest is on the pavilion principle. The benevolent asylum, which is mainly supported by the Government, gives a large amount of outdoor assistance, takes in all waifs and strays, and acts as a lying-in hospital. Old men are provided for in an institution at Liverpool. At Randwick is an asylum for destitute children, which receives a large amount of Government support; and there are two orphan asylums at Parramatta; but the state children are now being boarded out under the auspices of a Government board. There are two soup-kitchens and refuges, supported by private contributions, and also a charity organization society. There is a home visiting and relief society, intended principally for those who have known better days, and a prisoners' aid society, besides numerous friendly societies. All the churches are well represented, and to each is attached one or more charitable agencies.

The climate of Sydney is mild and moderately equable. It resembles closely the climate of Toulon. The mean temperature is 62°·6 Fahr. and the extreme range of the shade thermometer is from 106° to 36° Fahr. The sea-breeze which prevails during the summer comes from the north-east, and, while it tempers the heat, makes the air moist and induces languor. In winter the prevailing wind is from the west, and the air is dry and bracing. The annual rainfall is 50 inches. The hot north-west wind of summer sometimes sends the humidity down below 30°, and once it has been as low as 16°. In the cool westerly winds of winter it seldom falls to 55°, and never below 45°. The average humidity for the year is 74°. The mean tide is 3 feet 3 inches. (A. GA.)

SYENE (ASWAN). See EGYPT, vol. vii. p. 783.

SYENITE. See GRANITE, vol. xi. p. 49.

SYLBURG, FRIEDRICH (1536-1596), an eminent Greek scholar, and one of the greatest figures in the annals of German philology, was the son of a farmer, and was born at Wetter near Marburg in 1536. Wetter had then an ex-

cellent school, taught by J. Foenilius and Justus Vulteius, and Sylburg also got help in his studies from the preacher J. Pincier, whose daughter he subsequently married. His studies were continued at Marburg and Jena, and then at Geneva (1559) and at Paris. Here his teacher was Henry Estienne (Stephens), to whose great Greek *Thesaurus* Sylburg afterwards made important contributions. Returning to Germany, he was for a time a schoolmaster at Neuhaus near Worms, and then head of a new gymnasium at Lich, where he edited a useful edition of Nicolas Cleyntart's *Greek Grammar* (Frankfort, 1580), which was thrice reprinted during his lifetime. But the period of his important literary labours began when (having previously, in 1581, declined a call to the Greek chair at Marburg) he resigned his post at Lich and moved to Frankfort to act as corrector and editor of Greek texts for the enterprising publisher J. Wechel. To his Frankfort period belong the editions of Pausanias (1583), Herodotus (1584), Dionysius of Halicarnassus (2 vols., 1586—one of his best pieces of work), Aristotle (5 vols., 1587—dedicated to the landgraves of Hesse, from one of whom, Louis IV., he received a pension), the Greek and Latin sources for the history of the Roman emperors (3 vols., 1589-90), and the *Περὶ συντάξεως* of Apollonius. In 1591 he was attracted to Heidelberg by the treasures of the library, not yet scattered by the Thirty Years' War. Here he became librarian to the elector palatine, and was untiring in collecting further MS. treasures. At the same time the series of editions, which Wechel had begun to find too costly, was continued by the Heidelberg publisher Hieronymus Commelinus. At Heidelberg were printed Clement of Alexandria (1592), Justin Martyr (1593), the *Etymologicum Magnum* (1594), the *Scriptores de Re Rustica* (1595), the Greek gnomic poets (1596), Xenophon (1596), Nonnus (1596), and other works. All Sylburg's editions show great critical power and indefatigable industry. Indeed he wore himself out with work, and died on 16th February 1596, "nimis vigiliis ac typographicis laboribus consumptus," as his tombstone in the churchyard of St Peter's in Heidelberg has it. There is a careful notice of his life by K. W. Justi in Strieder's *Hessische Gelehrten-Geschichte*, xviii. 481 sq.

SYLHET, a British district of India, in the province of Assam, lying between 25° 12' and 23° 59' N. lat. and 91° and 92° 38' E. long., with an area of 5381 square miles. It is bounded on the N. by the Khási and Jaintia Hills district, on the E. by Cachar, on the S. by the state of Hill Tipperah and the district of Tipperah, and on the W. by the district of Maimansinh. Sylhet consists of the lower valley of the Surma or Barak river, and for the most part is a uniform level, broken only by scattered clusters of sandy hillocks called *tildás*, and intersected by a network of rivers and drainage channels. In the south eight low ranges of hills, spurs of the Tipperah Mountains, run out into the plain, the highest range being about 1500 feet above sea-level. There is also a small detached group in the centre of the district called the Ita Hills. Entering the district from Cachar, the Surma bifurcates into two branches: the main branch flows beneath the hills bordering the north-east part, while the minor branch, the Kusiára, flows in a south-westerly direction across the district; they again unite on the south-western boundary and fall into the Meghna under the name of Dhaleswari. Both branches are navigable by large boats and support a busy traffic. The wild animals of the district comprise elephants, tigers, buffaloes, bison, and several varieties of deer. The climate of Sylhet is extremely damp and the rainfall is heavy, reaching an annual average of over 150 inches; the rainy season generally lasts from April to October.