port commissary will designate the mess from which these articles will be supplied

The location assigned to the hospital on all troop ships, save one, is the after part of the main deck (mess deck) for the main ward, an isolation ward being built over this and communicating by an inside hatchway with it. The deck plan (main deck) is shown in Plate IX., Fig. 9, hereto attached. In the forward part of the hospital there are partitioned off the main ward, an office, dispensary, operating room, linen room, special diet kitchen, and two attendants' rooms. On the sides, fore and aft, are lockers for patients' clothing. The after part is partitioned for baths, closets, urinals, and laundry tubs. A storeroom for medical supplies is placed aft and below with a hatchway in the ward through the main deck. Above, on the promenade deck, is an isolation ward of twelve beds, two being enclosed for the treatment of refractory patients. This ward is provided with a separate bath, lavatory, and closets, and is accessible from below as well as from the deck. The deck floor of the main ward is laid over with cement on which is fixed a layer of linoleum. The deck floors of the kitchen, baths, dispensary, and operating rooms are tiled. The berth sections are double tiered, steel frames having wire mattresses and side slats, and are secured to the deck. Ventilation is effected, first, by overhead air ducts leading from the fan ventilating service of the ship; second, by open ports through the sides; third, by small movable electric fans within the ward. Heating is effected by the passage of warmed air through the ventilating conduit heated by steam coils and propelled by the steam fans. The air supplied by the conduits is also cooled by passing over refrigerating coils instead of steam coils and delivered in the same manner as the warmed air. By this device warmed air, cooled air, and air at outside temperatures may in turn be distributed by the fans. The dimensions of the main ward are, rooms included: length fore and aft between bulkheads, 44 feet; breadth at forward bulkhead, 39 feet; at after bulkhead, 32 feet; height between decks, 7 feet—indicating a total capacity of 16,400 cubic feet, or 644 cubic feet per berth section, fixtures included.

The diet kitchen is fitted with steam cooking fixtures and racks for utensils and mess furniture. The dispensary is fitted with shelves, drawers, bottle racks, etc. The operating room is provided with an outfit of instruments and apparatus for surgical operations, an electric heater for a sterilizer, and a portable electric light. The wards and rooms are lighted by incandescent lamps. All the plumbing is open sanitary work. The personnel of the hospital service consists of one surgeon, one acting hospital steward, and three privates of the hospital corps; these to be assisted by details of hospital corps, privates from troops in transit. The sick in quarters among the troops are attended by the medical officers accompanying them. Medical supplies for two thousand men for a period of six months are placed on board the oversea transports in the port of New York. These include bedding, hospital clothing, medicines, hospital stores, surgical instruments and dressings, disinfectants, etc.

On the coastwise transports the same general plan is adhered to, but the hospitals have less capacity and the fixtures and equipment are correspondingly less complete. These ships also have facilities for the isolation of infectious diseases, and their hospital outfit includes medical supplies for a period of three months for the maximum carrying capacity for troops and crew. Medical supplies of transports are replenished from depots in New York and San Francisco, and, in cases of emergency, at oversea ports where temporary depots have been established. The general arrangement of the oversea transports for the accommodation of the troops is shown in Plate VIII., Fig. 1, which is a sectional view of the troop ship *Thomas* refitted at Cramp's shipyard, Philadelphia, and cleared from the port of New York for Manila, P. I., November 4, 1899, carrying a regiment of United States Volunteer Infantry, a detachment of the army hospital corps, female nurses and other military passengers, besides a variety of military stores, freight, and baggage. The dimensions of this transport are: length 445 feet, beam 50 feet. Capacity, tons gross, 5,713. Berthing capacity for troops, 1,653. Total berthing capacity, 2,156. On the main deck (see Plate IX., Fig. 9) forward are berths for petty officers and seamen. Abaft of these quarters is a soldiers' lavatory containing sixty-four basins with hot- and cold-water taps, a number of closets, urinals, and shower baths over a cemented deck floor. Amidships on this deck the space not occupied by hatches and machinery is allotted to the messing arrangements of the troops and crew. A steam galley provides coffee, soup, and meat, six hundred rations of each at one time for the troops. An oven of sufficient capacity furnishes fresh bread for all on board. A large coffee mill is operated by electricity. A scullery, butcher shop, cold-storage room, and separate mess room for non-commissioned officers, firemen, oilers, and seamen find places on this deck on both port and starboard sides of the engines. The remaining deck space, from the engines forward to the lavatory, is fitted with folding mess tables and benches which when not in use are stowed between deck beams overhead. The troops are berthed below in nine compartments on the 'tween and orlop decks. The berth sections, having three tiers of berths each, are built of galvanized steel pipe fitted with canvas bed bottoms lashed by their margin to the piping and changeable for washings. The arrangement of the sections on the two berth decks is shown in Plate VIII., Figs. 2 and 3. A part of the crew berth in the forward part of the 'tween deck. Air ducts leading from the ventilating fans open into all berth compartments. The air space on troop decks per berth varies from eighty to one hundred and twelve cubic feet, fixtures included. Gun racks are fitted to the ship's sides in these compartments. Easy access to the berth decks is afforded by double stairways through large hatches, one or more in each compartment. On the 'tween deck forward of the engine space are separate staterooms, a closet and lavatory for women. A steam laundry with ironing and drying apparatus is installed on the port side, and an ice machine on the starboard side of the engines on this deck. On the orlop deck amidship are cold-storage rooms for meat and vegetables. The compartments below the orlop deck are allotted to storage and freight. Above on the spar deck staterooms for officers occupy both sides amidship, having aloft the engines, bathrooms, and closets. Forward of the engines on the spar deck is a dining saloon seating eighty persons, with a steam galley, ice-box, cold-storage room, and distilling apparatus adjoining the engine room, as shown in the spar-deck plan (Plate IX., Fig. 8). On the after part of this deck is another soldiers' lavatory, with baths, closets, and urinals accessible from the main and berth decks through the after hatchway. Between the second and third forward hatches on this deck is a soldiers' writing room. On the promenade deck amidship are additional staterooms and office rooms for officers and a smoking room (Plate IX., Fig. 7). Aft on this deck is built an isolation ward (Plate IX., Fig. 5), capacity twelve berths, communicating with this deck and with the main ward below. The upper (bridge) deck has rooms for the master and chief officers of the ship (Plate IX., Fig. 6).

The ventilating system is worked by two sets of fans, one forward, another aft, on the spar deck, with metal air ducts leading to all berth-deck compartments and to some storerooms. The fans work either by incast or exhaust, as required, and deliver air at outside temperatures, or warmed, cooled, or filtered according to the situation and needs of the ship. The rated capacity of each of the four fans with 500 revolutions per minute is 25,000 cubic feet of air per minute. At a trial test of the apparatus made by the builders the velocity of the air current passing into the air cleansing and cooling device attached to the fan was ascertained to be 1,000 feet per minute, with a discharge velocity in the hospital of 940 feet per minute and in the lower troop deck (at the farthest point from the fan) 950 feet per minute. Tests made in reduction of temperature (at a lower rate of speed of the fan of the

air by the refrigerating device, the temperature on deck being 80° F. and that of the water used 60°, showed a reduction of temperature of the air delivered to 62° F. This system may be regarded as on trial, as no complete reports of its performance under varying conditions at sea are yet available. Twelve hundred tons of fresh water may be shipped as ballast. Fresh-water tanks furnished with refrigerating coils are placed on the mess deck where they are accessible to the troops. The equipment of the ship includes fire plugs and hose and the customary marine life-saving apparatus. The commissary department is provided with a variety of subsistence stores, including the components of the ration and additional articles for sale to the troops and for issue to the sick, with fresh beef and vegetables in cold storage. Facilities for military exercises are afforded on the main deck by stowing the mess-room furniture. A library of miscellaneous books has been contributed to the hospitals of each one of the troop ships by the Red Cross organization through their New York agent.

A distinctive uniform is authorized for the employees of the transport service, and the ships fly the colors of the department. In general the object kept in view by officers of the army transport service has been to maintain the efficiency of the troops while on board by all practicable military methods, in order that on debarkation after a voyage they may be fit for active service without delay for recuperation. That this end has been attained in great measure is evident from reports of voyages made to distant oversea ports by troop ships refitted and despatched under the direction of the transport service. Recent experience has emphasized the fact that in modern warfare the most difficult problems are those involving celerity of movement of troops and the *materiel* of war without the precipitancy and disorder which invite loss and disaster. The development of land transportation by the American people has already reached an extent and efficiency which place them in the lead among nationalities. If this ascendancy is to be maintained a similar development appears requisite on the high seas. The work of the army transport service is a beginning in this direction. At the present writing a board of officers has completed its sessions for the purpose of revising the original Regulations of the transport service in order to adapt them to its requirements as determined by the condition of its operation from its organization to the present time.

Henry S. Kilbourne.

ARNICA.—*Leopard's Bane; Mountain Tobacco. Arnica* L. is a genus of the *Compositæ*, containing some eighteen species distributed through the cooler regions of the north temperate zone, of which *A. montana* L. has been extensively employed in medicine. It is a native of eastern and middle Europe, and yields two official articles, as follows: *Arnicæ Flores*, "the flower heads," and *Arnicæ Radix*, "the rhizome and roots."

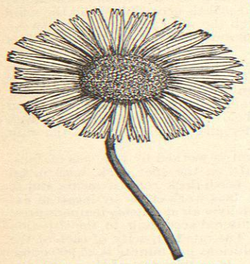

FIG. 284.—Arnica; flowering head. (Baillon.)

The plant is rather pretty, with a radical rosette of obovate leaves, from which rises a simple stem a foot or two high, bearing one or two pairs of leaves and terminated by from one to several large yellow flower heads.

Arnicæ Radix is thus described in the Pharmacopœia: "Rhizome about 5 cm. long and 3 or 4 mm. thick; externally brown, rough from leaf scars; internally whitish, with a rather thick bark, containing a circle of resin cells, surrounding the short, yellowish wood wedges, and large, spongy pith. The roots are numerous, thin, fragile, grayish brown, with a thick bark containing a circle of resin cells. Odor somewhat aromatic; taste pungently aromatic and bitter."

FIG. 285.—Involucre and Receptacle of Same. (Slightly enlarged.)

Arnicæ Flores are thus described: "Heads about 3 cm. broad, depressed-roundish, consisting of a scaly involucre in two rows, and a small, nearly flat, hairy receptacle, bearing about sixteen yellow, strap-shaped, ten-nerved ray florets, and numerous yellow, five-toothed, tubular disc florets, having slender, spindle-shaped akenes, crowned by a hairy pappus. Odor feeble, aromatic; taste bitter and acrid."

The receptacle of this head is very apt to contain the larvæ of an insect, wherefore some pharmacopœias direct that the florets only shall be employed. Several other yellow flower heads have been employed to substitute or adulterate arnica, but all fail to combine the one to two serialled involucre with the pitted and hairy receptacle.

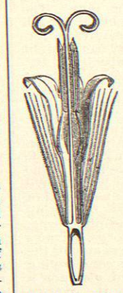

FIG. 286.—Single Flower of Same. (Enlarged.)

Both drugs have a strongly resinous odor and a pungent and acrid taste, that of the root being the stronger, and the dust of both is sternutatory. Their composition is similar, the rhizome being the stronger, with one-half to one per cent. of volatile oil, considerable resin, part of it acrid, ten per cent. of inulin, a little tannin, and the crystalline yellow acrid and bitter amaroid *Arnicin* ($C_{20}H_{30}O_4$), soluble in alcohol. The flowers lack the inulin, and their percentages of oil and resin are smaller. Their oil does not appear to be identical with that of the rhizome. Altogether, it would appear desirable to discontinue the use of the flowers.

Arnica is very active, both locally and systemically. It is a slow but powerful rubefacient to the external skin, and a powerful stimulant to raw surfaces, with some antiseptic power. It is highly irritating to mucous surfaces, being a stomachic and laxative in small doses, but an emetico-cathartic poison in overdoses. Besides its irritant poisonous properties, it is a systemic poison. Its systemic action is most concisely stated by Bartholow as follows: "In small medicinal doses arnica increases the action of the heart and arteries, and excites the functions of the skin and kidneys. In large doses, probably after a stage of excitement, depression of the circulation, of the respiration, and of the animal temperature ensues; violent headache is experienced, the pupils are dilated, and paresis of the muscular system comes on. In toxic doses, arnica paralyzes the nervous system of animal and organic life, and death ensues in a condition of collapse."

It would seem that some more important use might be found for a drug possessing such pronounced physiological actions as arnica than any yet developed. It has been used like aconite in reducing fever and decreasing the painful symptoms of many inflammations, especially in rheumatism, erysipelas, and painful menstruation. Externally it is a favorite vulnerary and rubefacient in

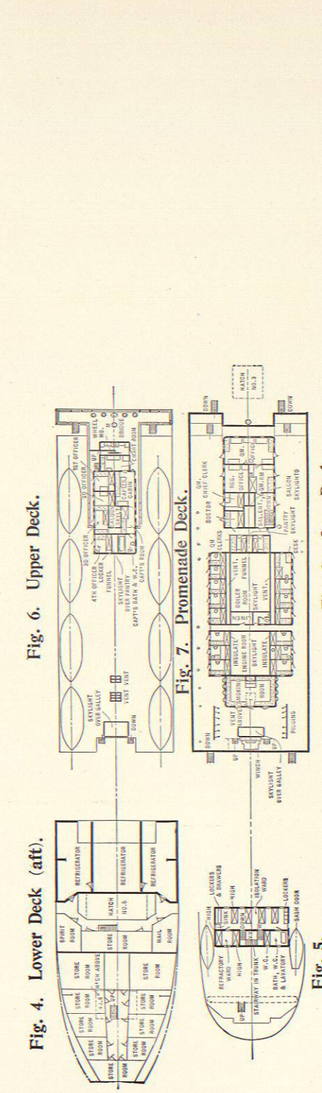

Fig. 6. Upper Deck.

Fig. 7. Promenade Deck.

Fig. 4. Lower Deck (aft).

Fig. 5.

Fig. 8. Spar Deck.

Fig. 9. Main Deck.

U. S. ARMY TRANSPORT "THOMAS."