metal, galvanic currents are generated which rapidly corrode the aluminum. It has hence been impossible to use vessels where the metal was soldered. A process has recently been devised which enables the welding of aluminum without the aid of a flux. This will greatly increase the usefulness of aluminum. The tensile strength of the metal is only one-fourth less than that of copper, and while its conductivity for heat is only half as great as that of copper, it is twice as great as that of iron. The use of aluminum as a conductor of electricity is also growing rapidly.

AN interesting investigation has recently been carried out by H. J. Möller of Copenhagen, and published in the *Berichte* of the German Pharmaceutical Society, on colored glasses, with particular reference to the proper color for bottles which are intended to protect medicines, etc., from the chemical action of the light. It was found that the best protection is afforded by black (opaque), red, orange and dark yellowish-brown glass—light brownish-yellow, dark green (with no bluish tint) and dark brownish-green glasses afford quite good protection; bluish-green, violet, milky, bluish and colorless glasses give little if any protection from the actinic rays of sunlight. For the preservation of wine, beer and liquors, dark brownish-yellow and dark yellowish-brown bottles are to be preferred, while light brown, light green and bluish-green glass is less to be recommended.

A NEW and curious chapter has been added to the chemistry of the radio-active elements by A. Debierne in one of the latest *Comptes Rendus*. By dissolving barium chlorid in a solution of actinium and then crystallizing or precipitating it out, a radio-active barium is obtained which shows many similarities to the radiferous barium from pitch blende. Its rays are capable of ionizing gases, excite the phosphorescence of barium cyanoplatinite, are photographically active, and are partially deflected in a magnetic field. The anhydrous chlorid thus obtained is self-luminous. On the other hand, this salt shows only the spectrum of pure barium, while that from pitch blende gives the radium spectrum. The former gradually decreases in activity, while the latter increases up to a maximum, at which it remains constant. Debierne considers that it is improbable that his active barium should contain any radium or any actinium, but that it is probable that by prolonged contact with actinium salts the barium has become itself temporarily active. This inductively active barium appears to be intermediate in its properties between radium and barium.

J. L. H.

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*EXPERIMENTAL STATIONS IN HAWAII AND PORTO RICO.**

THE last appropriation acts for the Department of Agriculture carried provisions for the inauguration of experiment stations in the islands of Hawaii and Porto Rico. In accordance with this the preliminary steps have been taken to determine the best plan of operation in each case and the subjects which are in most need of immediate attention.

Professor S. A. Knapp, of Louisiana, who for a considerable number of years has been engaged in subtropical agriculture on an extensive scale, was selected to investigate the agricultural conditions and possibilities of Porto Rico. Professor Knapp went to the island early in June. In general he will study the present agricultural conditions existing in Porto Rico, the lines of experimental investigation which should be undertaken there, especially in the immediate future, and the locations suitable for stations, together with the approximate expense of inaugurating and maintaining the work of the stations. He will also look into the feasibility of undertaking cooperative experiments with the residents of Porto Rico, and the best means of reaching the people through different classes of publications, demonstration experiments, and otherwise.

For the preliminary survey of the conditions in the Hawaiian Islands, Dr. W. C. Stubbs, director of the Louisiana Experiment Station, has been selected as especially fitted by experience. Dr. Stubbs sailed for Hawaii about the middle of July, and will spend the month of August in the islands. The conditions there with reference to station work are different

* From the *Experiment Station Record*.

from those in Porto Rico, as a station for experiments in sugar production has been maintained by private beneficence for a number of years. In connection with his investigation of the location of a station, Dr. Stubbs will consider the feasibility of combining the Federal station with the Hawaiian Experiment Station or the agricultural department of the Kamehameha Manual Training School at Honolulu. Here also the lines in which investigation is most needed, the possibility of greater diversification of the agriculture, the expense of inaugurating and maintaining experiment station work, and the means of disseminating information among the people will be carefully inquired into. This will probably prove a profitable field for investigations on the use and economy of water in irrigation, since according to reports received from authentic sources, in no other place is so much money expended for pumping water for irrigation. Some of the pumps are said to be raising 30,000,000 gallons of water per day from a depth of 500 feet, using coal that costs $10 a ton. The expense of irrigating in some cases reaches as high as $125 per acre annually.

SCIENTIFIC NOTES AND NEWS.

THE attendance at the Bradford meeting of the British Association was 1,915 distributed as follows: Old life members, 267; new life members, 13; old annual members, 297; new annual members, 45; associates, 801; ladies, 483; foreign members, 9. The British Association is fortunate in always arousing local interest and securing a large number of associates. It will be noted, however, that the attendance of members at Bradford—622—was not greatly in excess of the attendance at meetings of the American Association, although American men of science are scattered over a much wider area and undergo greater inconvenience in coming together in mid-summer.

THE grants appropriated for scientific purposes amounted to £945 and were distributed as follows: Mathematics and Physics—electrical standards (balance in hand), and £45; seismological observations, £75; magnetic force on board ship, £10. Chemistry—relation between absorption spectra and constitution of organic substances (balance, £6 8s. 9d. in hand); wave length tables, £5; isomorphous sulphonic derivatives of benzene, $35. Geology—erratic blocks (£6 in hand); photographs of geological interest (balance, £10 in hand); ossiferous caves at Uphill (renewed), £5; underground water of Northwest Yorkshire, £50; exploration of Irish caves (renewed), £15; life-zones in British carboniferous rocks, £20. Zoology—table at the Zoological Station, Naples, £100; table at the Biological Laboratory, Plymouth, £20; index generum et specierum animalium, £75; migration of birds, £10. Geography—terrestrial surface waves, £5; changes of land-level in the Phlegræan fields, £50. Economic Science and Statistics—state monopolies in other countries (£13 13s. 6d. in hand); legislation regulating women's labor, £15. Mechanical Science—small screw gauge (balance in hand) and £45; resistance of road vehicles to traction, £75. Anthropology—Silchester excavation, £10; ethnological survey of Canada, £30; age of stone circles (balance in hand); photographs of anthropological interest (balance of £10 in hand); anthropological teaching, £5; exploration in Crete, £145. Physiology—physiological effects of peptone, £30; chemistry of bone marrow, £15; suprarenal capsules in the rabbit, £5. Botany—fertilization in phæophyceæ, £15; morphology, ecology and taxonomy of podostemaceæ, £20. Corresponding societies—preparation of report, £15.

ONE of the most important actions taken at Bradford was a reference to the Council with a favorable recommendation of a plan for the establishment of a section of education which should deal not only with scientific education, but with education as a science. The report of the treasurer showed receipts of over $11,000, but the expenses of the year exceeded the receipts by about $4,000. This deficit was due to the fact that the Dover meeting last year was rather small, while the grants were as large as usual and there were some extra expenses in connection with the visit of the French Association. The items of expenditure were in round numbers $5,000 for printing, $2,500 for salaries, $2,000 for the expenses of the Dover meeting and $5,000 for scientific grants. In re-