CHEMICAL NOTES.

ADULTERATIONS OF SAFFRON.—Saffron is sophisticated with muscular fibre, the flowers of *Calendula officinalis*, safflower, *Crocus vernus*, *Punica granatum*, fragments of sanders-wood, glucose, glycerin, oil, chalk and heavy-spar.

PREPARATION OF ASHES DESTINED FOR THE EXTRACTION OF IODINE FROM SEA-WEEDS.—The most advantageous weeds for this purpose are the two varieties of *Fucus digitatus*. Dr. Thiercelin states that he has succeeded in extracting from the plant 3 per cent. of iodine.

MANUFACTURE OF PHOSPHORIC ACID.—Natural phosphates, unground, are dissolved in dilute hydrochloric acid. When the acid has ceased to act the clear solution is run off from the insoluble matters and mixed with sulphuric acid enough to saturate all the dissolved lime, leaving a mixture of hydrochloric acid, dilute phosphoric acid, and calcium sulphate. This mixture is submitted to pressure to separate the sulphate from the free acids, which are then concentrated, and the hydrochloric acid is condensed and collected for use by means of ordinary columns.—M. A. COLSON.

COMPLEX ACIDS CONTAINING BORIC ACID.—Dr. F. Mauri has formed boro-tungstic acid by dissolving tungstic anhydride in a solution of borax, and continuing to add the former until the liquid is no longer rendered turbid bd hydrochloric acid. He is engaged with the formation any the study of the boro-molybdic acid and its salts

COMPOUND OF TITANIUM TETRA-CHLORIDE AND OF PHOSPHORUS PROTO-CHLORIDE.—The composition of this compound is represented by the formula $TiCl_4PCl_3$.—M. ARMAND BERTRAND.

COMPOUND OF TITANIUM TETRA-CHLORIDE AND ETHYL OXIDE.—If the vapors of these two bodies are brought in contact, fine crystals of a greenish yellow color are produced.—M. ARMAND BERTRAND.

REDUCTION OF ETHYL NITRATE BY ALCOHOL.—Nascent ethyl nitrate is reduced in presence of alcohol, yielding ethyl nitrite and aldehyde.—M. ARMAND BERTRAND.

PRODUCTS CONTAINED IN THE COKE OF PETROLEUM.—Experiment shows that the accumulation of the carbon is effected with an increasing rapidity, and the weight of the molecule rises to a limit still little known, but which can be no other than the formation of insoluble bodies whose richness in carbon is equal or even inferior to that of the bodies which have remained soluble. We reach thus, by a progression easy to conceive, the term of the series which must equally include crystalline bodies such as graphite and diamond. It is known, on the other hand, that the higher polymers, when submitted to very high temperatures, seem to depolymerise themselves (as happens with metastyrolene), yielding gaseous carbon compounds.—MM. L. PRUNIER AND EUG. VARENNE.

ACTION OF MONO-BROMATED DIPHENYL-METHAN UPON AMMONIA.—If the ammonia is in alcoholic solution, ammonium hydro-bromate is deposited; and the alcoholic liquid, if precipitated with water, yields, as a principal product, a mixed ethyl-benzhydrolic ether. Concentrated aqueous ammonia acts differently; the crystalline bromine is gradually transformed, and in twenty-four hours the mass becomes liquid. In forty-eight hours more it becomes solid, and then it no longer contains bromated diphenyl-methan.—MM. C. FRIEDEL and M. BALSOHN.

SYNTHESIS OF CHINOLINE.—The alizarin blue of Prud'homme has the composition $C_{17}H_7NO_4$, and is probably a dihydroxylised quinon of anthrachinoline. It is formed from nitro-alizarin and glycerin, with the elimination of water. Chinoline is actually obtained on heating together nitro-benzol, glycerin, and sulphuric acid.—Z. H. SKRAUP, *Wiener Anzeiger*, 1880, 69.

FUNCTION OF LIME IN THE LIFE OF PLANTS.—E. v. Raumer and Ch. Kellermann assert that lime is absolutely necessary for the life of plants, and its function is most closely connected with the utilization of the carbohydrates.

CHEMICL INVESTIGATIONS IN THE BOHEMIAN CENTRAL MOUNTAINS.—J. Stocklasa has recently made an examination of the marls and clays of Priesen.—*Listy Chem.*, 4, 135.

BÖDECKER'S METHOD OF DETECTING ALBUMEN IN URINE.—The urine is slightly acidified with acetic acid, and a few drops of a solution of potassium ferrocyanide are added. In presence of even very slight traces of albumen a turbidity at once appears, and in a short time there is deposited a flocculent sediment. The test is exceedingly sensitive.

CHLORALUMINIUM USED AT CLOTH WORKS.—A sample contained 15.49 per cent. Al_2Cl_6, 1.13 Al_2O_3, 2.59 NaCl, 0.14 Na_2SO_4, 80.65 H_2O. Apparently formed by decomposing aluminium sulphate with barium chloride. F. STOLBA.—*Listy Chem.*, 4, 193.

CRYSTALLINE PRUSSIAN BLUE.—W. Gintl states that if recently precipitated Prussian blue be treated with a moderate excess of hydrochloric acid at a gentle heat, it dissolves to a slightly yellowish liquid, which, on exposure to the air, gradually deposits Prussian blue as a crystalline sediment, which displays a splendid coppery lustre by reflected light. So-called Turnbull's blue dissolves in hydrochloric acid in the same manner as ordinary Prussian blue, and yields similar crystals—a further evidence of the identity of the two compounds.

TRUE CLAY IN SO-CALLED CLAY SOILS.—A. Funaro has shown that the highest proportion of clay does not exceed 33 per cent.

PHYSICAL NOTES.

CERTAIN MODIFICATIONS UNDERGONE BY GLASS.—J. Salleron often meets with well made thermometers, the indications of which are erroneous to 8 or 10°, or more. Such changes occur at printing ink works, where oils are heated for several days to 270 ; in glycerin works, and with rectifiers of benzol. Glass is not merely modified when heated to 300 ; it undergoes true deformations at far lower temperatures. Thus the hydrometers used in sugar works, which are often exposed for a considerable time to temperatures of 95 , are affected. After an immersion of some days they are completely modified : their weight decreases, and they become erroneous to the extent of 7 or 8 B.

THE MAGNETIC APPARATUS OF M. EDARD.—Among other electric or magnetic appliances for the treatment of various diseases is mentioned a magnetic sand, which M. Edard imports from the Isle of Bourbon, and which has been subsequently found near Morbihan. Its application is said rapidly to revive diseased plants.

SPECTROSCOPIC STUDIES OF THE SUN, CONDUCTED AT THE OBSERVATORY OF PARIS.—L. Thollon asserts that the sun has entered on a period of activity, and he has described and figured certain luminous protuberances, to one of which he ascribes a height of more than 100,000 kilometres.

Dr. J. H. Gladstone read a paper "On the Specific Refraction and Dispersion of Isomeric bodies" before the Physical Society of London. He concluded that the dispersion of a body containing carbon of the higher refraction, is very much greater than that of a body containing carbon of the normal refraction (5), and that isomeric bodies which coincide in specific refraction coincide also in specific dispersion.

ULTRA-VIOLET RAYS.—J. L. Shönn has ascertained the position of the ultra-violet rays of the spectra of cadmium, zinc, thallium, calcium, indium, magnesium, iron, and aluminium. His apparatus is well adapted for the study of absorption spectra ; a column of water of 10 centimetres contained between two plates of quartz absorbs the greater part of the ultra-violet rays, whilst a block of very pure ice of 21 centimetres does not sensibly absorb the rays of cadmium in this portion of the spectrum.