

are in general much more sensitive to fumes, poisonous gases, and other similar effluvia, than are many adults.

This important point has been borne in mind in the design of the elementary laboratories, where sufficient fume-cupboards have been erected (mainly along the windows) to provide for the whole class when working upon unpleasant substances. The cupboards are themselves efficiently ventilated, so that it is hoped that the air of the laboratories may remain fresh even in the most adverse circumstances.

In the balance-room the balances are enclosed in special cases built as part of the fittings. They are placed on stable benches, which are wide enough to take open exercise books immediately in front of the balances.

The advanced laboratory will provide good working accommodation for twenty boys. A stone slab, covered by an asbestos hood, will be used for combustions and similar work, while a Carius cupboard, fitted with concrete floor, tiled sides, sliding steel door and an interior light, is built under one of the fume-cupboards. A separate balance-room is attached to the laboratory. Steam, gas, electricity, and water are laid on to this as to all other working rooms. One feature worthy of special note is that all filter-pumps are worked, not from the general laboratory circuit, but from a separate main communicating with the town main in the adjoining road.

BIOLOGY.

At present, biology is taught mainly in the junior school and the lower forms of the senior school; the biological laboratory in the new building is a small room (to hold eighteen or so) for the accommodation of the class of First M.B. candidates. Should further space be required for biology in the future, a large room on the second floor, to be used temporarily for physical geography, has been built in such a way that its conversion to a biological laboratory could be carried out with very little difficulty or expense.

The chemistry floor includes, in addition to the rooms already mentioned, a polarimeter room and a room—partly office, partly private laboratory—for the head of the science department. By reducing the corridor height on this floor some cross lighting and ventilation has been made possible.

THE SCIENCE LIBRARY.

The most attractive room in the building is the library, on the second floor. A large and airy room, it is floored and fitted throughout in oak. It may, perhaps, be claimed without exaggeration that the emphasis now laid in schools upon the humanistic aspect of science has been largely due to Clifton influence; and it is therefore not surprising to find that the science library at the College includes a rich selection of classical scientific books and memoirs, which will at length find a home worthy of them.

The Royal Observatory, Greenwich.

ANNUAL VISITATION.

THE annual visitation of the Royal Observatory took place on the afternoon of Friday, June 3; the usual Saturday date being changed owing to the Whitsun holiday.

The Astronomer Royal presented his report, which deals with the work of the observatory for the year ended May 10, 1927. The usual observations of the sun, moon, planets, and fundamental stars are being continued with the Transit Circle; also of stars brighter than mag. 8.0 between N. Decl. 32° and 64°, and the stars selected for comparison with Eros at the opposition of 1931. The corrections to Brown's Tables of the moon in 1926 were +6.5" in longitude, and -0.8" in latitude; they have been slowly diminishing since the Tables were first used, in 1923. Mr. Cullen has made a redetermination of the declinations and proper motions of the brighter stars, from observations made with the instrument during the whole interval since its erection in 1850. He finds for the correction to Boss +0.33" +0.0068" ($t - 1925.0$).

The Altazimuth has also been used in recent years to find the correction to Boss's declinations from observations in the Prime Vertical; the values found are +0.29", +0.44", +0.45", +0.51" at declinations 45°, 35°, 25°, 15° respectively. These are intermediate between the values given by Raymond and Eichelberger.

The Cookson Floating Telescope has been borrowed from the Observatory of Cambridge for a third period of seven years; it is used for determining latitude variation and the constant of aberration. The reductions for the second seven years are nearly completed.

Fourteen completed determinations of stellar parallax have been made during the year with the 26-inch refractor, bringing the total up to 330.

The 30-inch reflector has been used for a determination of the effective temperatures of stars of early type; the results for twenty-two stars have recently been published in the *Mon. Not. R.A.S.* The instru-

ment has also been used by Mr. Merton for photographing comets Comas Sola, Stearns, Pons-Winnecke, and Grigg-Skjellerup.

Plates are being taken with the Astrographic Equatorial for determining proper motions by comparison with those taken twenty-five to thirty years ago. The work is now nearly complete from declination 65° to 71°. Dr. H. Groot is also examining the astrographic plates for detecting double stars on them. He has found 187 pairs with separation less than 5 seconds in the zones 65° to 71°. Mr. Merton mounted two aeroplane lenses of 20 inches focus, working at F/5.6 on the tube of the astrographic telescope. These have proved very useful for photographing comets; it was with a similar lens that Mr. F. J. Hargreaves photographed comet Grigg-Skjellerup in advance of Harvard and Yerkes Observatories.

The sun was photographed on 251 days; most of the missing days are filled by photographs taken at the Cape or Kodaikanal; solar activity has been considerable, but with marked depressions at times. Between May and January there were ten naked-eye groups; but since January there have been no very large spots. Messrs. Ross have supplied new enlarging lenses for both the photoheliographs, which improve the definition at the sun's limb.

The late Mr. W. H. Wesley made drawings of the corona from the Greenwich expeditions' photographs of 1898, 1900, 1901, 1905; also from Mr. McClean's of 1908. Miss A. M. D. Crommelin made similar drawings of the eclipses of 1914, 1919. These have been reproduced in the *Philosophical Transactions*, Series A, vol. 22. Mr. Davidson and Col. Stratton have discussed the photographs obtained in Sumatra in 1926. The results will shortly appear in the *R.A.S. Memoirs*.

A party from the observatory will visit Giggleswick for the eclipse of June 29. The programme includes comparison of the intensities of certain calcium lines,

the spectrum of the chromosphere from *D* to the extreme red, and direct photography of the corona. Mr. Greaves and Mr. Witchell are viewing the eclipse from an aeroplane.

The magnetic observations are now all made at Abinger; the mean values of the elements for 1926 are: Decl. W. $13^{\circ} 10' 4''$; Hor. Force, 0.18581; Vert. Force, 0.42947; Dip, $66^{\circ} 36' 2''$. Comparison of magnetic disturbances as recorded at Greenwich and Abinger shows that the latter are smaller by about 3 per cent. The quinquennial revision of the Admiralty magnetic charts was carried out, and isogonals for 1927.5 adopted. After some necessary improvements in the insulation, the Schuster-Smith coil magnetometer was adopted as the standard from February last. A redetermination of the moment of inertia of Dr. W. Watson's standard cylinder gave a result identical with his value found in 1903; this cylinder is now adopted as a standard.

The following weather statistics are for the year ended on April 30. The average is that of the seventy-five years 1841-1915: Temperature 50.2° , being 0.6° above the average. Mean daily movement of the air, 284 miles, just the average value. Bright sunshine, 1320 hours, being 29.7 per cent. of possible amount. Rainfall, 28.20 inches, being 3.96 above

average. The wettest month was November, 4.77 inches; the driest December, 0.38 inches.

Two standard sidereal clocks (Shortt Nos. 3 and 11) have been in use since July; during the last fifty days their rates have been nearly coincident, and the clocks have never differed by more than 0.05^s . A mean time clock of the Shortt type has been ordered, which will be used for the distribution of radio time-signals through the Rugby Station. Rhythmic signals will be sent at 10^h and 18^h .

The observatory took part in the radio longitude campaign last autumn. Advance copies of the time-determinations and the times of receipt of radio signals have been printed and circulated. The corrections to the adopted longitudes of Paris and Washington appear to be less than 0.02^s . The longitude of Pulkovo was determined by the Russian observers as $2^h 1^m 18.572^s$.

Allusion is made in the report to Mr. G. Merton's researches on the comet Grigg-Skjellerup, published as an *R.A.S. Memoir*. The observed perihelion passage was earlier than the predicted time by 0.2 days.

Dr. A. C. D. Crommelin retired from the Observatory on May 10, after thirty-six years' service (see *NATURE*, May 28, p. 790).

South-Eastern Union of Scientific Societies.

ANNUAL CONGRESS.

THE thirty-second annual congress of the South-Eastern Union was held at St. Leonards-on-Sea on June 25-28, the president being Dr. A. B. Rendle, whose address was devoted to "The Flora of Sussex, Past and Present." The Wealden flora dates from the fourth continental period. Tree-ferns and other ferns comprise twenty-three out of the seventy species of Wealden plants known, a flora representing a moist, warm, and possibly tropical climate. In a paper by Dr. E. J. Salisbury it was shown that the plants that had become extinct in certain countries or had definitely diminished numbered 294, or about thirty per cent. of the total British flora, although speaking for the whole country those that had become actually extinct was surprisingly small. About eighteen or twenty seaside plants were disappearing, principally by indiscriminate picking of the flowers. Seakale was believed to have been first offered for sale at Covent Garden in 1875, and this came from Pevensy. Members were surprised at the quantity seen in flower on the beaches east of Hastings. The Mayor of Hastings, an enthusiastic botanist, read a paper of much interest on the "Weeds of a St. Leonards Garden."

In the Zoological Section Prof. E. W. MacBride gave an address on "The Origin and Nature of Mutations," a subject he has made peculiarly his own. He defined mutations as conspicuous deviations from type which occurred suddenly without obvious cause and were strongly inherited, most of them, however, being failures from the point of view of natural selection. Reference was made to Tornier's theory that abnormal variations are due to the environment in which the eggs were laid and fertilised. The effects of the weakening of the germ could be recognised in the characters of domestic breeds of wild animals. Evil conditions surrounding the egg rapidly produced mutations, and quickly as they come they as quickly go.

In a paper entitled "Territory in Bird-Life," Prof. C. Lloyd Morgan dealt with the habit of birds to separate from the flock in early spring to enter upon their territory period. Dealing particularly with the

lapwings, he said that so long as the birds were in flocks the behaviour of all the male birds was much the same, and no marked hostility was shown, but directly they got into the territory phase hostilities broke out. If a cold snap came after a warm period, the males resorted to the flock-phase and all became perfectly friendly once more. When once a male had fixed his territory he sang his best to attract the females to his area, but the males were warned off, and their presence in his territory was resented. The female that joined him was just as jealous as he was. How the territory was defined is a subject for further examination, but evidently it was a directive factor of some sort.

In the Geological Section, Mr. H. B. Milner chose for his address "The Weald-Boulonnais Section of the English Channel," and with the assistance of carefully prepared plans showed the structure of the submarine ridges in the Channel area. With the help obtained from Admiralty charts he was able to show that the gravel and other banks arranged themselves in a remarkable manner on the lines of the Armorican foldings which are so well shown in the structure of the chalk downs and the Wealden rocks. It was also seen from the charts that near the French coast there was a remarkable gorge stretching away from near Cape Blanc Nez to the North Sea, which was clearly an old drainage line, and may have some connexion with the river system which existed before the Dover Strait was pierced. There is an important bank off Dungeness, called by the French "Roc d'Angleterre", and it may be that here is an uprise of the Wealden rocks which underlie the Ness. A paper by Dr. W. M. Whittard was read on "Fossil Vertebrates from the Weald."

A large party of geologists visited Mr. Lewis Abbott's collection at 8 Grand Parade, attracted thither by the discoveries made by Mr. Abbott when the ground was excavated for the building of the White Rock Pavilion. White Rock proves to be a white chalky marl comparable to the Chalky Boulder Clay of elsewhere, containing many foreign boulders, and evidencing widespread glacial action. A large