The Mira Maximum of 1906.—In No. 4110 of the *Astronomische Nachrichten* Prof. Nijland publishes the results of his observations of Mira made during the period August 24, 1905, to February 24, 1906. The curve accompanying the paper shows that a sharp maximum occurred on January 3, when the star's magnitude was 3·9. This was preceded by a very flat minimum of about the ninth magnitude, extending from the commencement of the observations until November 9, 1905, and then a steep ascent to the maximum. The lowest magnitude, 9·05, occurred on September 23, 1905.

METEOROLOGY OF THE NILE VALLEY.[1]

THE Egyptian Survey Department, constituted some years ago, is adding largely and rapidly to our knowledge of the hydrography, geology, and meteorology of the Nile basin. The director-general, Captain Lyons, R.E., has prepared and issued a monograph dealing very fully with the physiography of the Nile basin. In this work, which was reviewed in Nature of September 6 (vol. lxxiv., p. 461), he combines the results of former observers and investigators with the data accumulated during the past ten or twelve years by his department. It is a storehouse of information relating to that most remarkable, and until recent years most mysterious, of rivers.

We propose to give a brief statement, based on the information contained in the monograph, of the more important features of the meteorology of the Nile Valley and their relations to the physiography of the whole area.

The river obtains its supplies from two collecting areas, one the equatorial lake plateau (between lat. 5° S. and lat. 5° N., and long. 28° and 35° E.), and the second the Abyssinian mountain and plateau area (between lat. 7° N. and 14° N., and long. 35° and 40° E.).

The former is the larger catchment basin, and includes the Victoria, Albert Edward, and Albert Lakes, which serve as reservoirs to store the rainfall of the whole region. The Victoria Lake (equal in area to Scotland) is about 4000 feet above the sea, and is slightly lower than the mean level of the plateau. The ground rises slightly to the south and east, and rapidly to the west to the elevated peaks of Ruwenzori, which separate it from the rift valley, in which are situated the Albert Edward and Albert Lakes connected by the Semliki River. The catchment area of the Victoria Lake is only of comparatively small extent, not more than twice the area of the lake, the level of which hence varies very slightly with the season. The Victoria Nile, which issues from the north of the lake, is precipitated over the Ripon Falls, and thence passes over flat, marshy ground to the Choga Lake Swamp, and descends by a series of rapids, and finally by the Murchison Falls, to the lower level of the Albert Lake at its northern extremity in lat. $2\frac{1}{4}$° N.

The Albert Edward and Albert Lakes, with their tributaries, appear to collect a larger volume of water than the Victoria Lake. The Victoria Lake discharges by the Victoria Nile a nearly constant amount, averaging 500 cubic metres per second, and the Albert Lake amounts varying between 500 and 1100 cubic metres per second.

The discharge of the lake system is carried off northwards from the Albert Lake by the Bahr-el-Jebel, or Albert Nile, as it is called by Sir William Willcocks. It descends rapidly from a level of 2300 feet to 1500 feet at Gondokoro (lat. 5° N.), in a narrow channel with numerous falls and rapids, and thence to Lake No (lat. $9\frac{1}{2}$° N.) through an extensive flat and swampy region. It is joined at Lake No by the Bahr-el-Gazal, and about eighty miles further down stream by the Sobat. The former drains a large portion of the Soudan, its head-waters being chiefly in the equatorial belt. The Sobat is formed partly by drainage from the same belt and partly from the southern face of the Abyssinian plateau.

Between Lake No and Khartoum, the main stream is now known as the White Nile. The discharge of this river below Lake No varies to a slight extent during the year, and averages only 350 cubic metres per second, and hence considerably less than the supply passing into the river from the Albert Lake. The difference represents the loss by evaporation in the extensive swamp region through which these streams flow. That of the Sobat is only considerable during the rainy season, from April to December, ranging between 380 cubic metres and 1470 cubic metres per second. The White Nile below the junction of the Sobat (lat. $9\frac{1}{2}$° N.) to Khartoum (lat. $15\frac{1}{2}$° N.) receives no affluent, and flows in a broad valley as a wide stream of moderate velocity. This part of the Nile plays a subordinate but important *rôle* with respect to the Nile floods. From May to September the flood water brought down by the Sobat River is ponded up or held back in this reach of the Nile, and hence does not contribute to the Lower Nile flood. Captain Lyons states that this action stores up an average of about 1500 million cubic metres from the Sobat flood, which is supplied to the Nile in October, November, and December, thus prolonging the period of the Nile flood, and delaying the fall of the Nile to its low-water stage.

The main flood water of the Nile is brought down by the Blue Nile and the Atbara from the Abyssinian plateau. The rainfall occurs between June and September, and is immediately discharged down the hills into the valleys, the greatest portion down the Blue Nile, which joins the White Nile (there forming the Nile) at Khartoum. The maximum flood of the Blue Nile is about 12,500 cubic metres, and of the Atbara 5000 cubic metres, per second.

The Nile flood proper is hence due solely to rainfall in the Abyssinian and adjacent Soudan area. It commences in June, and reaches its maximum about the end of August or beginning of September. The maximum height of the Nile flood, or the total discharge during the flood period, may hence be accepted as a measure of the total rainfall over that area, just as the variations of the Victoria and Albert Lakes represent the seasonal variations of the rainfall in their catchment areas.

The Nile below the junction of the Atbara (lat. 18° N. to lat. 34° N.) receives no affluents, and flows in a comparatively narrow valley, over which the flood waters, with their rich alluvial contents, are distributed by means of a vast system of canals.

The Nile basin may hence be divided into three areas or regions, not differing greatly in breadth from south to north. The most southerly is the equatorial lake belt between lat. 5° S. and 5° N., an intermediate region between lat. 5° N. and lat. 18° N. includes the Soudan and Abyssinia, and the northerly region comprises the lower Nile basin from lat. 18° N. to the Mediterranean in lat. 34° N. The low river supply (January to May) is chiefly due to discharge from the equatorial lake area, and the summer flood supply to discharge from the Abyssinian region.

The following gives a sketch of the more important features of the meteorology of the Nile basin, based on the important information and data of Captain Lyons's monograph.

Temperature is remarkably uniform in the equatorial lake region. Thus at Entebbe, on the north shore of the Victoria Nyanza, it ranges only between a mean of 72°·7 in January and 70° in July. In the Nile basin north of about lat. 5° N. temperature is lowest in January, and attains its maximum in May in the southern half of the valley south of Khartoum, and in July in Nubia and Egypt. The annual range of temperature increases northwards from the equatorial belt to northern Egypt. The greater part of the Nile basin is within the tropics, and is throughout the whole year characterised by high temperature. That portion of it between lat. 15° N. and lat. 18° N. (in which are the meteorological stations of Khartoum, Berber, and Dongola) is the hottest and driest area in the Nile basin. It has an elevation of about 1200 feet. To the south is the comparatively damp and cooler region of the Bahr-el-Gazal, the Albert Nile, and the lake plateau, whilst to the north the valley descends slowly to the relatively cool Mediterranean coast. This—the Soudan hot area—is one of the hottest regions in the world. The following gives a comparison of the mean monthly maximum temperature of Berber in that area, and of Jacobabad, the hottest station in India, and also of Massawa, on the Red Sea, in the same latitude as Berber:—

[1] "The Physiography of the River Nile and its Basin." By Captain H. G. Lyons, R.E., Director-General Egyptian Survey Department.

Mean Maximum Temperature.

	Berber, Lat. 15° N.	Jacobabad, Lat. 28° N.	Massawa, Lat. 15° N.
January	86·7	73·6	84·2
February	90·0	77·9	85·3
March	96·6	91·1	87·1
April	106·0	103·1	90·5
May	110·5	111·6	94·5
June	112·1	112·7	99·5
July	108·5	107·8	101·6
August	110·3	103·8	101·5
September	108·5	103·5	97·7
October	104·0	98·6	95·0
November	96·0	86·8	89·6
December	89·6	76·7	86·9

The data show that at the hottest period, from May to September, the high-temperature conditions are as intense in the Soudan hot area as in Upper Sind, and are more prolonged and persistent. This hot area plays a very important part in the meteorology of the Nile basin. It is throughout the whole year much hotter than Lower Egypt. The difference between the mean day temperature at Berber and Alexandria increases from 8° in January to 16° in April and May. It thence diminishes under the influence of the monsoon rainfall in the Soudan region to 8° in August, and increases to a second maximum (12°) in November. It is undoubtedly due to the presence of this permanent hot area in the central Nile basin that northerly winds prevail almost continuously in the northern half of the basin (*i.e.* north of Berber). The Massawa data also indicate that the hottest portion of the Red Sea is from 10° to 16° cooler during the day hours from March to October than the land area to the west. As the width of the Red Sea in lat. 15° to 20° N. is about 300 miles, it is evident that the presence of this relatively cool area will modify considerably the air movement and pressure distribution in the adjacent land areas, more especially the Soudan comparatively low-lying area.

Much less is known of the pressure distribution than of temperature in the Nile basin. Barometric observations are being taken at a considerable number of stations. When the elevations of the observing stations have been accurately determined by the Survey Department, it will then be possible to give, for the first time, a satisfactory statement of the changes of the distribution of pressure during the year. It is to be hoped that this information will be available in Captain Lyons's monograph on the meteorology of the Nile basin, which we believe he has under preparation. Comparison of the temperature conditions of northern India and of the Nile basin suggest the probable pressure scheme. Pressure in January and the following three or four months is probably lowest in the interior regions of Africa to the south of the equator. An independent local low pressure begins to form in the Soudan hot area in March, and intensifies to some extent in April and May. This low-pressure area limits the advance of the monsoon winds in that region in the same manner that the low-pressure area in Baluchistan and Sind, and the Himalayan mountain barrier, limit the northward extension of the south-west monsoon winds in India. During the period from June to September, an extensive low-pressure area extends from the Soudan across south-west Asia to Upper India, but it is probable that the Soudan depression, due to the local thermal conditions, maintains an independent existence from the Upper India depression, and is separated by a belt of somewhat higher pressure across the Red Sea. This is not confirmed as yet by observation. Captain Lyons, however, indicates in the chart of the mean distribution of pressure in northern and central Africa in July his conviction that a local belt of low pressure stretches across central Africa between lat. 12° N. and 18° N. This either fills up in October and November or is transferred southwards.

The air movement in the Nile basin is on the whole comparatively simple. It is almost continuously from north to the north of lat. 17° or 18° N. (Berber), and is hence a drift up the valley due to permanent temperature and pressure differences between the east Mediterranean and Upper Nile valley. Also in the extreme south of the basin (in the basin of the Victoria and Albert Lakes) it is, so far as is indicated by the available data, almost equally persistent, but from the opposite direction, that is, from south and south-east. That region is hence, during nearly the whole year, within the sphere of the south-east trades. The movement is apparently for a short period in the early months of the year light, variable, and irregular, but chiefly from north.

The air movement in the intermediate region between the equator and lat. 16° N. to 18° N. is typically monsoon. During one period of the year dry land winds (from the north) prevail, followed during the remainder of the year by humid oceanic winds (from south or west). The influence of the Soudan hot area begins to be shown in March, and winds alternate between northerly and southerly directions in April and May. Thus at Khartoum the percentage of steadiness decreases from about 90 per cent. in January to 40 per cent. in May. In the beginning of June a change similar to that occurring in India in that month is initiated. Steady winds, the continuation of the south-east trade winds, which have previously given heavy rain to the equatorial lake area, prevail during the next three months. The direction of the air movement rapidly changes in proceeding northwards from south to west, determined by the position of the Soudan low-pressure area and action due to the earth's rotation. The current hence advances directly to the Abyssinian mountain or plateau area, the axis of which runs due north and south, its forced ascent over which gives rise to the heavy precipitation over the greater part of the plateau. No rain falls at this time in the Red Sea coast districts on the lee side of the plateau. The plateau hence plays (but much more completely) the same part for the Abyssinian branch of the south-west monsoon current that the West Ghats play with respect to the Bombay branch. This movement holds steadily until September, when the monsoon current contracts southwards, and light, northerly winds extend slowly to the neighbourhood of the equator. There is hence a clearly marked monsoon alternation of winds and of season (dry and wet) in the intermediate area between lat. 5° N. and lat. 18° N.

The distribution of the rainfall in the Nile basin is very clearly exhibited in a series of monthly charts in Captain Lyons's monograph. A chart showing the amount and distribution of the average annual rainfall would have been a useful and valuable addition to the series. Charts of annual or seasonal rainfall are, as a rule, even more valuable for comparison than charts of monthly rainfall.

The air movement has shown that the Nile basin may be divided meteorologically into three areas, viz. the area of dominant northerly winds (north of lat. 17° N.), the area of alternating monsoon winds between lat. 17° N. and the equator, and the area of dominant south-easterly winds south of the equator. The rainfall differs greatly in its characteristic features in these three areas. In the northerly region it occurs during the winter months, as in Syria, the Euphrates valley, and the Iran plateau, and is small and very variable in amount. The average annual fall at Alexandria and Suakim is about 5 inches, at Port Said 2 inches, and at Suez ½ inch. In the intermediate monsoon region practically no rain falls from November to April. Thunderstorms occur in May, chiefly in the southern districts, and frequent heavy rain from June to September or October, according to position. The rainfall is heaviest on the western and central portions of the plateau. In the Himalayas the rainfall is, as a rule, heaviest at an elevation of about 4000 feet. The Abyssinian data are too scanty to show whether there is any line of maximum rainfall lower than the level of the interior plateau or higher mountain ranges, where the highest elevations exceed 15,000 feet.

The precipitation in the equatorial lake region has a double maximum and minimum in its annual variation, related, as Captain Lyons points out, to the apparent movement of the sun. The rainfall is small in amount during the period of heavy rainfall in the monsoon region from June to September. It is heavy from October to December, and again in March and April, and is light to moderate during the intervening months of January and February, and moderate in May.

The following summary of the annual rainfall in the Upper Nile basin is taken from Sir William Willcocks's "Nile in 1904." In the catchment basin of the Victoria and Albert Lakes, the mean annual rainfall may be taken as 50 inches, with large fluctuations between good and bad years; over the Albert Nile region it is about 40 inches, with severe droughts occasionally and excessive rain in some years. In the catchment basin of the Sobat River it probably averages 40 inches, and in that of the Bahr-el-Gazal region 30 inches. The rainfall over the Abyssinian plateau may be taken as 50 inches, and in the lower reaches of the Blue Nile and Atbara 30 inches. These are undoubtedly rough estimates, but, so far as can be judged from the exact data given for a number of individual stations in Captain Lyons's work, they are approximately correct values. They also indicate that the mean annual rainfall over the Upper Nile basin differs little from 40 inches. This is a somewhat remarkable result, as it agrees closely with the average rainfall in India, which, according to Blanford, is 42 inches.

The rainfall in the equatorial lake belt resembles in its seasonal distribution that of Ceylon, and that of the intermediate region (the Soudan and Abyssinia) that of western India. In western India, as in the East African monsoon region, the cool and dry season is rainless, with clear skies and light to moderate land winds. The rains in each agree in period, in the comparative suddenness of the change from the dry to the wet season, in the occurrence of almost daily heavy rainfall, and also in the rapid withdrawal of the humid currents at the end of the season. The meteorological data indicate clearly that the rainfall in both areas is due to the rapid extension of the south-east trade winds northwards from the equatorial belt at the same critical epoch, and probably under the same general conditions. There is one very important difference. The monsoon current in the Nile basin does not extend beyond lat. 16° to 18° N., being bounded to the north, not by a range of mountains, but by an area of permanent low pressure during the season, due to thermal actions. It curves rapidly from south to west, and is hence determined directly to the western face of the Abyssinian plateau and mountain masses, which in their highest points attain an elevation of 15,000 feet. The Bombay current in India extends as far northwards as the East Punjab (lat. 30° to 35° N.), where its further progress is barred by the Himalayas. The Abyssinian plateau exhausts the humid current much more completely than the West Ghats, as the rainfall at Massowa and other towns on the Red Sea to the east of the plateau is practically nil.

It would be interesting to determine whether the humid current is converted into a vertical movement over the plateau or whether it continues to march eastwards, and perhaps to contribute to the monsoon rainfall (of the same period) in the mountain region of Yemen, in south-west Arabia.

Captain Lyons has devoted considerable attention to the question of the variations of the Nile flood, and hence of the rainfall in the Nile basin, from year to year. The data show that very large variations occasionally occur amounting to ±35 per cent. of the mean. He infers from the data of years that they do not exhibit any regular cyclical variation, and hence that they cannot be directly correlated with the eleven-year sun-spot period or the thirty-five-year Bruckner period.

It is now, we believe, fully established that Abyssinia, India, and Burma, with the Malay Peninsula, receive nearly the whole of their rainfall from the same vast reservoir and evaporating area, the Indian Ocean and seas, and under the same general meteorological conditions, and by means of the same general air movement. These facts, on the one hand, indicate a probable similarity or parallelism of the seasonal variation of rainfall in all three areas due to general conditions in the contributing oceanic area, and, on the other, an unequal and unlike variation due to variation of local conditions in the three large areas of distribution; also as the rainfall of the Abyssinian plateau is due to the same branch of the monsoon current as that of western India, any parallelism of variation is more likely to be exhibited by these two regions than by either compared with Burma or north-eastern India (dependent on the Bay monsoon current). The actual variation in any one year will hence be due to the resultant of the general and of the local conditions. It is also probable that the largest variations will be due to the general variation over the whole area of supply. The data furnished by Captain Lyons are, on the whole, in full agreement with these inferences. The most remarkable case of similarity of seasonal variation is exhibited by the data of the past fourteen years. The following gives comparative data of the rainfall of India and of the Nile floods from 1892 to 1905. The former data are obtained from the Indian meteorological publications, and the latter from Captain Lyons's memoir:—

Year	Ratio of mean actual to normal rainfall in India	Ratio of actual to normal Nile flood
1892	1·12	1·20
1893	1·21	0·99
1894	1·15	1·22
1895	0·95	1·15
1896	0·88	1·06
1897	0·99	0·89
1898	1·01	1·07
1899	0·73	0·63
1900	0·99	0·89
1901	0·90	0·87
1902	0·95	0·63
1903	1·05	0·89
1904	? below	0·75
1905	much below normal	0·65
Period 1892–4	1·16	1·14
„ 1895–8	0·94	1·05
„ 1899–1903 or 1905	0·93	0·78

It is a noteworthy fact that the Abyssinian rainfall, as indicated by the Nile floods, is subject to much larger range of variation than the rainfall of India, as might perhaps have been anticipated. The data show that from 1892–4 the rainfall in India and in Abyssinia (assumed to be roughly proportional to the total Nile flood) was in considerable excess from 1892–4, about normal from 1895–7, and more or less in defect from 1898 to 1905. The parallelism would have been more exact if the rainfall of western India had been given instead of that for the whole of India. The 1896 drought in India was due chiefly to the weakness of the Bay current, and not of the Arabian Sea current. It may be noted that the data for the variations of the level of the Victoria Lake agree generally with those of the Abyssinian rainfall, as indicated by the Nile floods. Thus, according to Captain Lyons, 1892–5 was a period of high level, 1896–1902 a period of falling level, and 1903 a year of rising level. This remarkable parallelism, strictly in accordance with the general simple inferences stated above, suggests two problems for the consideration of meteorologists. These are, first, the causes of the large variations from year to year of the rain supply over the immense land area of India, the Soudan, and Abyssinia, and, secondly, the determination of any invariable antecedent conditions which may serve as indications and be utilised for forecasting these variations. Captain Lyons in the last chapter of his memoir takes up both of these problems, but acknowledges that his investigations are only in the introductory stage. It is, however, interesting that his present conclusions on the whole agree with those of Indian meteorologists. He shows, for example, that pressure in the Egyptian region is below the normal in seasons of good Nile floods and *vice versâ*. This is the usual relation between pressure and rainfall in India, and is also in accordance with theory. Captain Lyons also points out that the monsoon variations of pressure are frequently, if not invariably, the continuation of similar conditions which have prevailed for some time previously. This is also in accordance with Indian experience. He also points out that they are probably in some cases related to the widely distributed variations of pressure studied by Sir Norman Lockyer and Dr. Lockyer, and also to the long-period variations in India. The latter are marked by or accompany prolonged abnormal variations or anomalies of the Indo-oceanic air movement. He also considers that they are occasionally determined by variations in the position and intensity of north-east Atlantic anticyclones. This is by no means improbable, but until more is known of the actions that determine the displacement of the more or less permanent anticyclones, it is doubtful whether an occasional coincidence could be accepted as sufficient evidence to establish a relation. Some meteorologists, we believe, consider anticyclones to be comparatively inert masses, and others, on the contrary, as sources of action. They are remarkably persistent in position and character, and their variation of position from one period to another in south-western Europe is closely related to the abnormalities of weather. Where theoretical opinions differ so largely it is almost certain that it will require twenty-five to fifty years' data at the least to test the relation between the Abyssinian rainfall and the position of the anticyclone in south-western Europe or the adjacent Atlantic.

NEW PHYSICAL AND ENGINEERING DEPARTMENTS OF THE UNIVERSITY OF EDINBURGH.

THE new buildings for the natural philosophy (Prof. MacGregor) and engineering (Prof. Hudson Beare) departments of the University of Edinburgh were opened on October 16 by Dr. Andrew Carnegie in the presence of a large and influential gathering. The proceedings took place in the large lecture theatre of the natural philosophy department, and were presided over by the Chancellor, the Right Hon. A. J. Balfour. Part of an address entitled "A Plea for Science Teaching," delivered by Dr. Carnegie before declaring the buildings open, was printed in last week's NATURE (vol. lxxiv., p. 648).

The Chancellor then moved a vote of thanks to the benefactors. He was glad to have the opportunity of mentioning the work of the friends and admirers of the late Prof. Tait, who had instituted a fund to encourage research, which he hoped would make these walls illustrious to all time. No more fitting tribute to Prof. Tait's memory could possibly have been contrived. Though Prof. Tait worked in what he could hardly call a laboratory, ill-equipped and wholly inadequate to the work of modern research, yet he left a name which for all time would be associated with the great development of physical knowledge which marked the last fifty years of the recent century—a movement which he believed would be conducted with ever-increasing acceleration through the earlier years of the present century. He was glad also to have an opportunity of saying to Lord Elgin that the work he had done as chairman of the Carnegie Trust was a work for which he had earned the gratitude of every man interested in the fate of the Scottish universities, and in the maintenance of the position which Scotland had held for more than 150 years in the world of learning. Proceeding, the Chancellor referred to Dr. Carnegie, whose munificent beneficence to many great causes, and, so far as they were concerned, especially to the Scottish universities, was known, and was destined to leave a permanent mark and do permanent good in Scotland.

Sir William Turner, in seconding the motion, referred to the great kindness of Sir Donald Currie, who, he said, had taken a great weight off his mind when he told him he need not be under any difficulty in finding the money to hand over to the municipality for the site on November 11 two years ago. He also desired to thank Sir John Jackson for his generous gifts, and stated that before long he hoped they would be in a position to receive from him a very handsome addition to the Tait memorial fund.

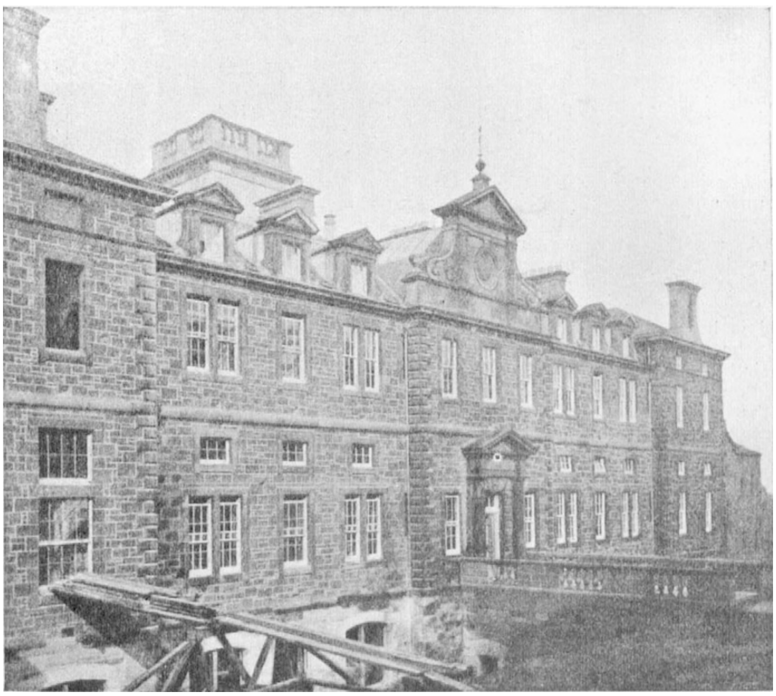

FIG. 1.—South front of new Natural Philosophy Buildings, University of Edinburgh.

Natural Philosophy Buildings.

The accompanying illustration (Fig. 1) shows the south front of this block of buildings. The building which has been transformed into a physical institute—the old surgical hospital of the infirmary—consisted of a main block 107 feet by 43 feet running nearly east and west, with wings at both ends 62 feet by 38 feet, and a block 71 feet by 51 feet running north towards the new engineering buildings, this north block including at its junction with the main building a tower 89 feet in height. The outer walls have been almost entirely utilised as they stood, with one important exception—on the southern side of the main building, by terracing the ground and piercing the lower part of the wall with large windows, the old dark basement rooms have been converted into lofty, well-lighted laboratories. The interior has been largely reconstructed, and all the floors are now concrete, supported on east and west steel girders.

The principal floor, entered directly from Drummond Street, contains the lecture theatre, apparatus rooms, library, professor's research rooms, &c. The lecture theatre, 45 feet long, 46 feet wide, and 32 feet in height, with seating accommodation for 250 students, is lit entirely from an opening in the roof, and is ventilated by an electric fan. The lecture table is 30 feet long, standing in an experimental area 15 feet wide; it is supplied with hot and cold water, high-pressure water, steam, gas, vacuum, air-blast, oxygen, and a number of electric circuits, and a heliostat has been placed in a window of the apparatus room so as to send a beam of sunlight along it. Opening off the lecture theatre is a preparation room with the necessary work benches; this room contains also the main switchboard, from which current will be distributed throughout the building from the town mains and from the accumulators. The apparatus room has a corridor entrance immediately opposite that of the preparation room; it is intended only for lecture apparatus. On the west side of the apparatus room provision has been made for a smaller lecture room, capable of accommodating about eighty students, and on the ground floor there is another small lecture room for the department of applied mathematics. The library and reading room is 37 feet by 29 feet, with a southern exposure, and opens off the entrance hall.