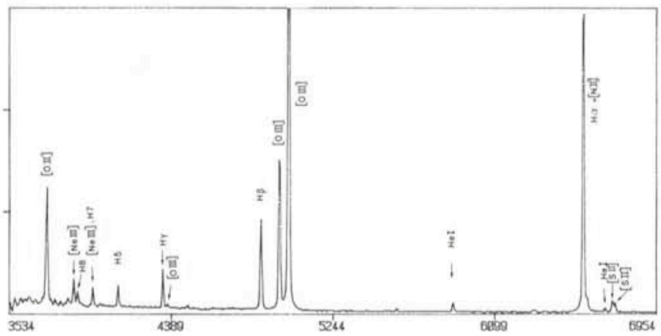

Fig. 2: *Spectrum of an H II region in NGC 55, taken at La Silla with the IDS at the Cassegrain focus of the 3.6-m telescope.*

case the total amount of bright stars recently formed in the 30 Dor complex is less than 1/5 of the stars of the same age formed in the whole LMC. The situation is very different for that in a blue compact galaxy where a complex like 30 Dor would be the galaxy itself. The homogeneity of the abundance distribution in the LMC (Pagel, 1978, *MNRAS,* **183,** 1 p) shows that the different parts of the LMC evolve with more or less the same time scale. These considerations on the LMC indicate that this galaxy and (at least we may hope) those of the same type are the best candidates to disentangle the different problems of chemical evolution.

As previously said, the chemical evolution of a galaxy is ruled by 3 main parameters, the IMF, the SFR, and the stellar heavy element production. It can be shown (e.g. Tinsley, 1980, *Fund. Cosm. Phys.,* **5,** 287) that, at a given stage of evolution determined for example by the amount of gas left in the galaxy, the abundances depend mainly on one quantity, the so-called *yield.* It is the mass of heavy elements produced and ejected in the interstellar medium by a generation of stars divided by the mass of small unproductive stars ($M < 0.8\ M_\odot$) and of remnants of more massive stars. A measurement of abundances and of the gas mass fraction provides a direct determination of this yield. Some attempts have been made to use the observed yield as a probe for stellar evolution theories, in particular, these last years, for mass loss in massive stars (Chiosi and Caimmi, 1979, *Astron. & Astrophys.,* **80,** 234). The higher the mass loss, the smaller is the metal production and the yield. The claim was that the observed yield is compatible only with very high mass loss rate. However, recent observations show that the mass loss is lower in the LMC than in our Galaxy and, more generally, is proportional to the metallicity (Maeder et al., 1981, *Astron. & Astrophys.,* **90,** L17). Then one expects, on the basis of a mass loss effect, a yield higher in the LMC than in our Galaxy. This is the opposite of what is observed. The yield deduced from a sample of Irregulars and compact galaxies is 0.003 ± 0.001 (Pagel and Edmunds, 1981, *Ann. Rev. Astron. & Astrophys.,* **19,** 77) while it is 0.005 ± 0.001 in our Galaxy. This example clearly shows the difficulty to use the yields. In fact, the yield is a combination of 2 quantities, the IMF for the small stars and the heavy element production by massive stars. An apparent variation of the yield from a galaxy to another can be due to variation of one or both of these quantities. But, provided one can determine by some other means the amount of small stars, from a M/L ratio determination for example, the yield could effectively lead to some insight in basic stellar evolution.

The comparison of the abundances of different elements can give other information. If one looks at an element produced only in massive stars ($M > 10\ M_\odot$), such as oxygen, and another produced mainly in lower mass stars ($M < 5\ M_\odot$), such as nitrogen, the ratio of these 2 elements allows an estimation of the proportion of low and high mass stars, that is the slope of the IMF for $M > 1\ M_\odot$ (Alloin et al., 1979, *Astron. & Astrophys.,* **78,** 200). Obviously, this is true only for a continuous star formation process, since in case of bursts the N/O ratio depends also on the ages of the bursts.

Systematic observations of a large sample of Magellanic-type irregular galaxies will lead to a considerable improvement of our understanding of galactic evolution. In order to be fully efficient, these observations must permit us to determine a great number of parameters, such as the abundances of various elements, the total mass, the H I distribution, the stellar continuum and H_α fluxes . . . We have undertaken such a programme of observation. The first step has been the determination of abundances in 10 Magellanic-type irregulars by the measurement of H II region spectra (Fig. 2). They were obtained during two missions at the ESO 3.6-m telescope with the Cassegrain Boller and Chivens spectrograph. These spectra are now nearly reduced. However, additional parameters, in particular the photometry, are still lacking. We hope that the above considerations will prompt astronomers to study more thoroughly these objects which are extremely promising, despite their ugly appearance.

ESO WORKSHOP ON "THE MOST MASSIVE STARS"

The workshop on "The Most Massive Stars" took place in the ESO Headquarters in Garching from November 23–25, 1981. It was attended by 63 participants from 13 countries, and a total of 28 contributions were presented and, sometimes vivaciously, discussed.

The most massive stars were chosen as a subject for the workshop because of their relevance for the evolution of galaxies as a whole. The largest ground-based telescopes and even more, in the near future, the space telescope can study the most massive stars, which happen to be also the most luminous, in the nearby galaxies. We need to understand well the physics and evolution of these stars to interpret correctly the observations, determine their properties and correlate them with those of the galaxies they belong to.

The specific aim of the workshop was to confront people concerned with modelling of massive stars with the most recent observational results in this field. Among the topics which were discussed are the effects of mixing and mass loss on the evolutionary tracks, the H-R diagrams for the brightest stars in the nearby galaxies, the WR stars of Pop I, the evolution of massive binaries, the supermassive object R 136 in 30 Doradus, the initial mass function of massive stars, the use of the luminous stars as distance indicators and the possible role played by very massive objects in a pregalactic phase of the evolution of the universe.

Special attention was devoted to the discussion of the critical areas in the theory of evolution of massive stars and to the uncertainties and selection effects of the observations.

S. D.

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