tion system evident in the control of vertebrate ontogeny, however, is also reminiscent of the colonial ascidians and of the sponges (see, for example, the recent studies of John, Campo, Mackenzie and Kemp, *Nature New Biology*, **230**, 126; 1971). The experiments of Moscona (*Soc. Exp. Biol. Med. Proc.*, **92**, 410; 1956; and *Proc. US Nat. Acad. Sci.*, **43**, 184; 1957) dramatically illustrate the like–like recognition processes among vertebrate cells. Cell suspensions of embryonic cartilage or kidney tissue exhibit specific cell re-aggregation into aggregates recognizable in terms of their tissue of origin. In mixtures of cartilage and kidney cells specific aggregation of like with like persists. This phenomenon extends beyond species barriers. In mixed cultures of chicken and mouse cells there was preferential association of kidney cells with kidney cells and liver with liver irrespective of the species of origin. The role of like–like recognition is clearly of major importance in a host of systems and the simple ascidian model demands study at the molecular level.

Boyse, Old and their colleagues are involved in mapping cell surfaces both topographically by immuno-electron microscopy and genetically. Surface antigens are present in a patchwork array of discrete areas varying in size according to the antigen and the cell type (*J. Exp. Med.*, **130**, 974; 1969). The extensive phenotypic variation of mammalian cell surfaces is apparently the result of multiple alleles at a limited number of genetic loci coupled with differential gene activity.

In the near future it should be possible to discuss cellular recognition in much simpler terms.

INTERSTELLAR MOLECULES

OH in Radio Galaxies

from a Correspondent

THE search for molecules in space takes on a completely new dimension with the discovery of OH molecular absorption lines in two external galaxies, M82 and NGC 253, by L. Weliachew of the Owens Valley Radio Observatory (*Astrophys. J. Lett.*, **167**, 47; 1971). Following several unsuccessful searches dating from 1967, this is the first observation of interstellar molecular lines originating from outside the Galaxy.

One of the major growth points in radio astronomy at present is the study of molecules in galactic gas and dust clouds. Two years of vigorous activity by astronomers in the United States have led to the identification of twenty distinct molecules in the interstellar medium. In addition to this, several isotopic species, such as the ^{12}C and ^{13}C variants of formaldehyde, have been detected. The subject grows ever more complex with rival groups now chasing bigger fish. A recent *IAU Circular* (2330) announced the presence of a seven-atom structure—methylacetylene CH_3C_2H—in the galactic centre, as well as hydrogen isocyanide HNC and isocyanic acid HNCO in some bright emission nebulae.

So far, fifteen organic molecules have turned up, but these are all feeble sources and many hours of observation are necessary to record the emission. The strongest molecular emitters are the enigmatic hydroxyl and water vapour sources. These are characterized by enormous intensity, very small angular size, and dramatic variability, and are certainly some kind of celestial maser (see *Nature Physical Science*, **232**, 52; 1971).

There is unfortunately a snag when it comes to searching for emission lines from molecules in other galaxies. Even the most powerful OH emitters in our Galaxy would, if placed in the nearby Andromeda nebula, be way below the limit that any present radio telescope could detect. A better way of finding OH in distant galaxies is to search for the characteristic absorption features at 1,665 and 1,667 MHz impressed on the continuum radiation from a powerful background source. Historically this parallels the successful method which, in 1963, pinpointed OH in our Galaxy as an absorption feature against Cassiopeia A.

At Owens Valley, Weliachew selected M82 and NGC 253 as suitable candidates for an experiment exploiting the absorption technique: these are galaxies which have moderately powerful radio sources at their centres to act as background radiators. For M82 the OH 1,665/1,667 MHz lines show up in the spectrum at a radial velocity of 240 km s^{-1} and for NGC 253 at 190 km s^{-1}. Taken together with phase angle information these values are strong evidence that the absorption is indeed associated with remote objects rather than our immediate neighbourhood.

It is all too easy to gain the impres-

Selective Antitumour Virus Drugs

To find a drug, as Levinson, Woodson and Jackson have done, which not only selectively inactivates RNA tumour viruses but also has already been clinically tested and used to treat human infections is a rare stroke of good luck. The compounds isatin β-thiosemicarbazone (IBT) and two derivatives, N-methyl IBT and N-ethyl IBT, have been available for several years now; they have a wide spectrum of anti-viral activity directed against both RNA and DNA viruses and N-methyl IBT has been used to treat smallpox. But curiously enough no one had tested IBT and its derivatives for effects on the RNA tumour viruses until Levinson and his colleagues took on the job; they could scarely have hoped for more promising results than those they report in next Wednesday's *Nature New Biology*.

Their first experiments with N-ethyl IBT suggested that this substance blocked the production of Rous sarcoma virus by transformed cells just as it blocks the growth of viruses of eight other groups. But further analysis showed that cells transformed by Rous sarcoma virus continued to produce virus particles in the presence of the drugs but the particles were rendered non-infectious. Pursuing this paradoxical clue they tested to see if N-ethyl IBT reacted directly with Rous sarcoma virus particles so as to inactivate them and sure enough that was precisely what was happening.

Further tests proved that both N-ethyl and N-methyl IBTs, but not the parent IBT molecule itself, inactivate a variety of strains of Rous sarcoma virus, avian leukosis virus and mouse sarcoma virus. For example a fifteen minute exposure at 37° C to 40 μM N-ethyl IBT caused more than ninety per cent reduction in the infectivity of Rous sarcoma virus.

By contrast these N-substituted IBTs do not react directly with and inactivate vaccinia virus, poliovirus or Newcastle disease virus. Herpes simplex virus is, however, inactivated when N-ethyl IBT is suspended in phosphate buffer but not when it is suspended in tissue culture medium. Certain herpes viruses have, of course, been linked with malignant tumours.

How do these compounds selectively inactivate the RNA tumour viruses? Levinson and his colleagues have examined two obvious possibilities but have drawn blanks. N-ethyl and N-methyl IBTs do not disrupt Rous sarcoma virus particles neither do they inhibit the reverse transcriptase activity in these viruses. Clearly more detailed investigations are needed to reveal the target molecule or structure in RNA tumour viruses and herpes viruses which renders them susceptible to these drugs.

It is still early days and it would be foolish to raise hopes too high, but these experiments offer a remarkably promising lead. It is now important to establish whether or not N-methyl or N-ethyl IBTs can cause the regression or prevent the growth of, for example, sarcoma induced in mice by mouse sarcoma virus. If such experiments are successful the case for clinical trials with selected human cancer patients may be irresistible.